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Chapter 1 Software Overview

1.1 Laser Engraving System Introduction

Laser engraving system through a computer numerical control machine tools to achieve effective control, according to the user's different requirements of the completion of processing tasks.

The system including control board, control panel, and supporting software. This manual describes how to use the software to complete the task of laser processing. (Motherboard wiring and control panel operations, see the accompanying manual and control panel wiring board operating instructions).

1.2 Software Supported File Formats

Vector format：dxf, ai, plt, dst, dsb…etc.
Bitmap format：bmp, jpg, gif, png, mng,…etc.

1.3 Environmental Requirements

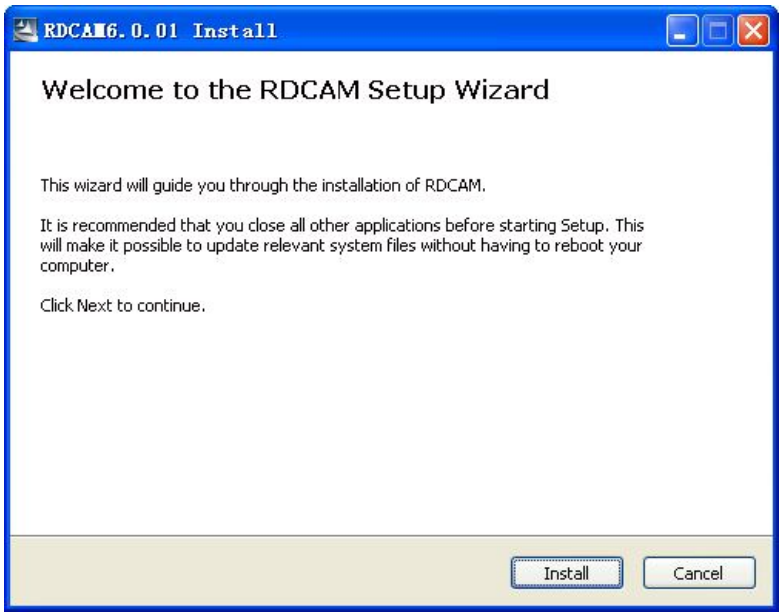
⑴ WindowsXP operating system and above, XP recommended.
⑵ Above CPU586,above PIII or PV recommended.
⑶ Memory, above 1G recommended.

Chapter 2 Software Installation

2.1 Software Basic Installation

2.1.1 Install Steps

（1） Double-click the RDCAMSetup.exe under the installation directory, the following dialog box appears:


RDCAM6.0.01 Install
Welcome to the RDCAM Setup Wizard
This wizard will guide you through the installation of RDCAM.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
Click Next to continue.
Install
Cancel

（2） Click【Install】，when extract copy is to be completed, the installation main interface appears:

2.1.2 Installation Settings

The installer can choose different installation content.

1> Install/Uninstall USB driver , reference《Chapter 3 Install USB Driver》

2> According to the different customer application needs and the habit of using to select the type of software

a. Stand-alone software LaserWork.
b. The software that plug-ins to CorelDraw. Support the version from Coreldraw11 to X5.
c. The software that plug-ins to AutoCad. Support the version from 2004 to 2010.
d. The software that plug-ins to Cadian.
e. The software that plug-ins to Illustrator.

3> Choose a different installation languages

At present, it support Simplified Chinese, Traditional Chinese, English and the custom language type.

4> Select the software matches the motherboard

The software can support three kind of motherboards:RDLC430、RDLC320、RDC633X. Both RDLC320 and RDC633X are compatible, but RDLC430 is different. So, please choose the corresponding software with motherboard. Otherwise, it does not work.

5> Locate install path

When install the LaserWork, default install path is "C:\", for change the install path, check this option.

When install the plug software RDPlug, under normal circumstances, the install program will locate to the target software automatically. If the installer does not locate to the target software automatically, you need to check this option, and locate to the target software manually.

6> Pen drawing lines

This option is only applicable to a particular machine, which has the function of the chalk line, ordinary machines do not need to check this.

7> Plug laserwork

The installer default install a special plug-ins RDPlug, if the users are more accustomed to using LaserWork program ,can check this.

8> Demo version installation

According to the type of software installation, the installation language, the choice of motherboard generate different versions of the DEMO Software.

2.1.3 Installation

Choose the type of software, installation language and the appropriate motherboard. Click【**Install**】to install the software. After installation is complete, the following dialog box appears to prompt the user that the software has been installed successfully.

2.1.4 Exit

After installing the installation needed. Click【**Exit**】to end the installation process.

Because of the possible need to use several installation, so the installation dialog does not

automatically exit, until users click button【Exit】.

2.1.5 Other Matters

1> Before installing the plug-in software, the software that has been articulated should be shut down. After installation, restart the software.

2> The regular version and the DEMO version of the plug-in software is covered by each other.

3> In the default installation path, the normal version and the DEMO version of the independent software and different types of independent software motherboard with each other.

For the same time to install two versions, select the【Locate install path】.The regular version and the Demo version should be installed in the different location.

In addition, need to the appropriate software installation location, manually add a desktop shortcut for the software.

4> Modify the information of manufacturers

In the package, in addition to RDCAMSetup, there are four text files.

Info_Sche、Info_Tche、Info_En、Info_Other, the four files correspond to the software information of manufacturers that be displayed in Simplified Chinese, Traditional Chinese, English and the custom language. If the four text is modified, manufacturer information also will be installed when the program was installed.

Open the text that should be modify, an example in Simplified Chinese:

0 = Company Name:

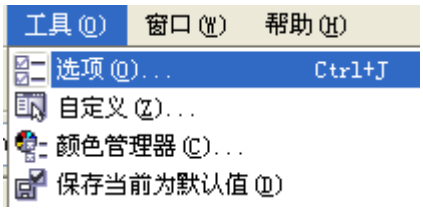
1 = ... (Fill in company name here)

And so on, the company information in other languages is the same set.

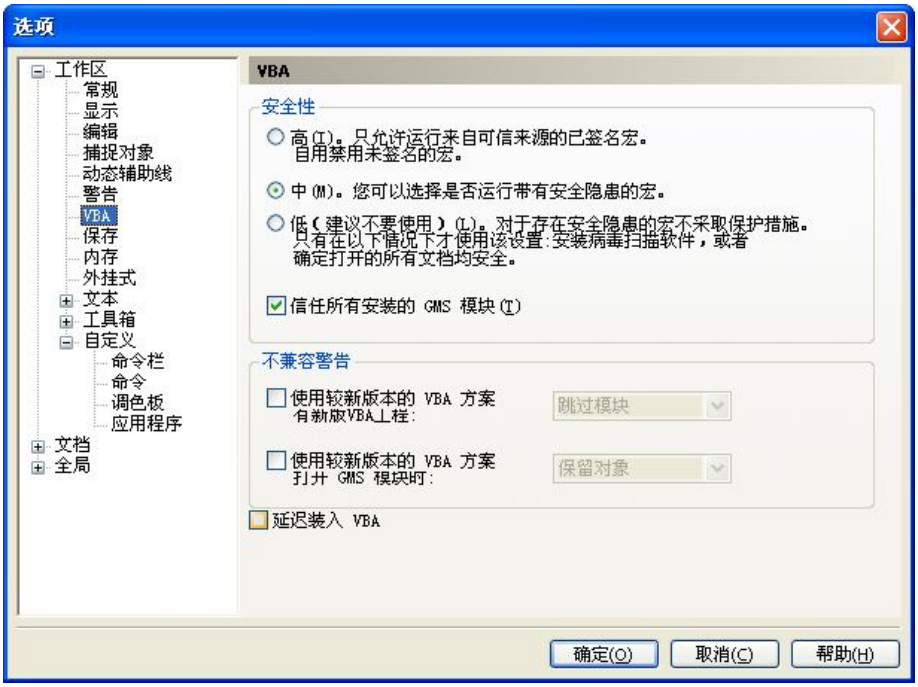
2.2 The Plug-in of CorelDraw Installed

Plug-in software support the version from CorelDraw11 to X5, but some simplified versions of CorelDraw is not supported. Here to the installation of CorelDraw12 as an example to introduce the installation process of plug-in software. If not specified, it is referring to CorelDraw12.

Before installing the plug-in software to run CorelDraw.



Select 【Tools】->【Option】



In the pop-up dialog box, select VBA, on the right do not check the “delay load VBA”, then OK, and exit the application CorelDraw.

Run the program of installation, choose “Type” to “CorelDraw_Laser”, then click 【Install】.

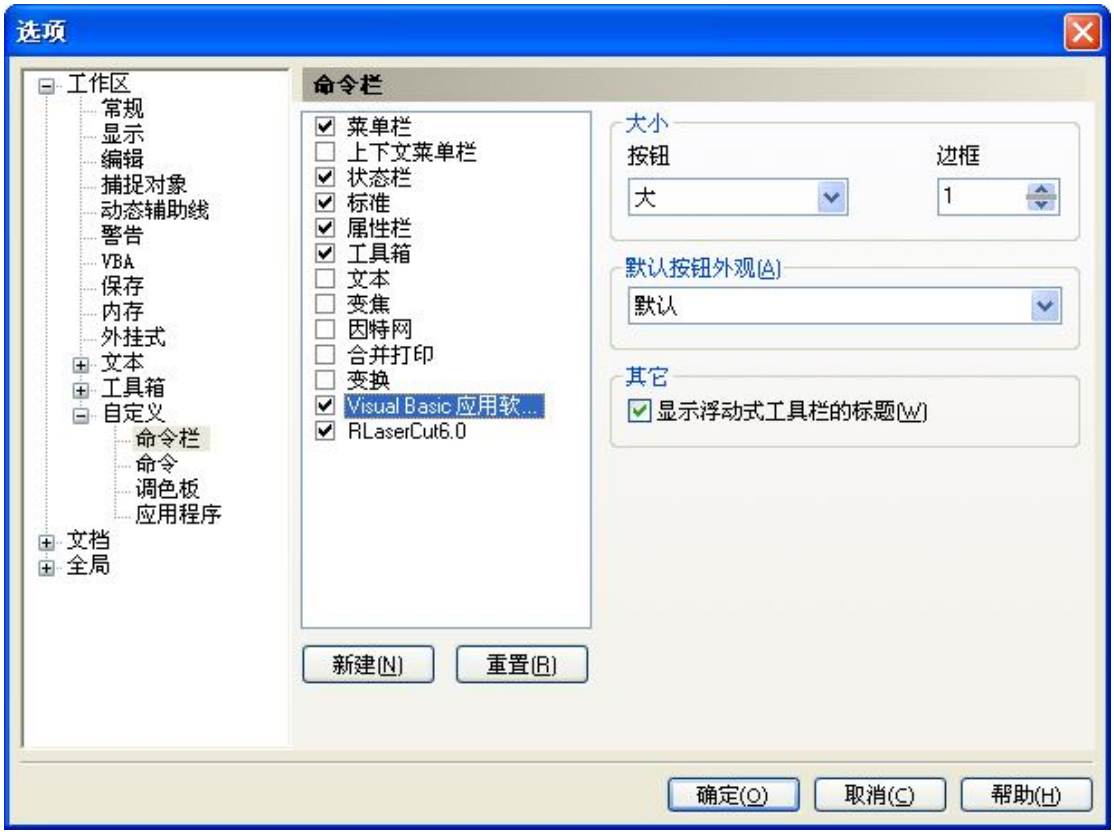
The installer will automatically install the plug-in software to the all versions of CorelDraw RDCAM that are installed on the operating system and pop-up dialog box.

For some versions of CorelDraw (such as green version) may not automatically navigate to the locate where the CorelDraw is installed on. Only need to check “Locate install path” on the installation software, and then manually browse to navigate the folder location to the root of CorelDraw software where the plug-in program should be installed on.

Exit the installation program, and run CorelDraw.

Toolbar in the CorelDraw interface will appear .

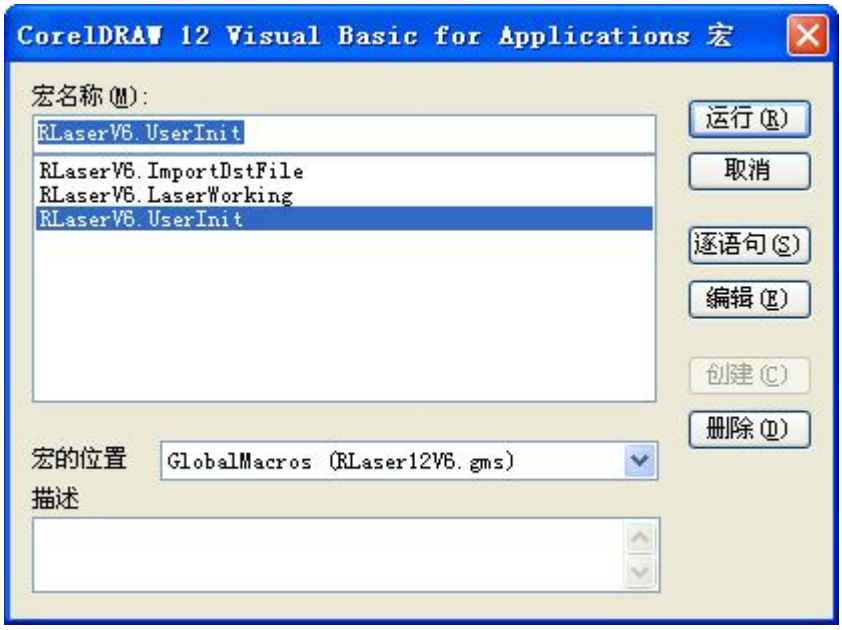
If the button does not appear, you should select 【Tools】-> 【Option】in the menu.



On the left select the “command bar” and then check “Visual Basic applications”, and select “OK”.

, this tool bar will appear in the software, select the first button .

If the toolbar does not appear, reinstall the software CorelDraw.



In the “macro location” select “GlobalMacros(Rlaser12V6.gms)”.

And the “Macro name” choose the RlaserV6.UserInit. And then “Run”.

2.3 The Plug-in of AutoCad Installed

AutoCad plug-ins can be used to AutoCad2004-2010 non-simplified version. Here to the installation of AutoCad2004 as an example to introduce the installation process of plug-in. If not specified, it is referring to AutoCad2004. Close all running AutoCad programs before AutoCad plug-in installed.

Run Setup. Select “AutoCad Laser” as The “Type”, and then click 【Install】.

Setup will automatically install the RDCAM plug-in software to all versions of AutoCad that were installed on the operating system and pop-up dialog box.

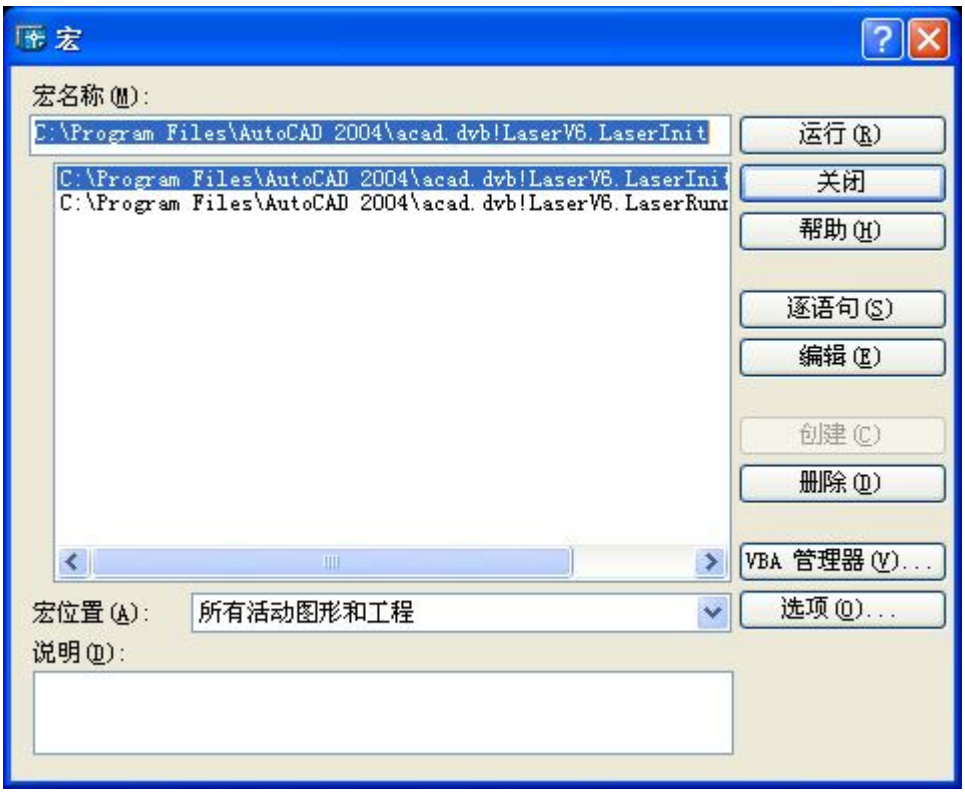
For some vesions of AutoCad(such as green version) may not navigate to the locate where the AutoCad was installed on. Only need to check “Locate install path” on the installation software, and then manually browse to navigate the folder location to the root of AutoCad software where the plug-in program should be installed on.

Exit the installation program, and run AutoCad.

Toolbar interface in AutoCad will appear

If the button does not appear, select 【Tools】->【Macro】(A)->Macro(M) in the menu.

If you can not find it in the menu, it is because the version of AutoCad may not support the plug-in. Pleast re-install a full version of AutoCad.



In the pop-up dialog box, select LaserInit, and run.

The plug-in toolbar can occur if you select this option, but when you close AutoCad and then open the AutoCad software again. But also do not see the toolbar. Then it is possible that your computer is infected with a virus. You must manually to define the boot loader works of AutoCad, or you can re-check for viruses or reinstall the operating system and AutoCad software.

Manual process of loading plug-in as follows, select the menu 【Tools】->AutoLISP->加载.

In the dialog box, you should to choose the “Content” button that was under the “Start Group”.

Select “Add” button in the pop-up dialog box. In the AutoCad directory, manually locate and select acad.dvb,acad.lsp. And loading these two files.

Adding the file, close the dialog box, and then close the AutoCad. You can see the plug-in toolbar when you open the AutoCad again.

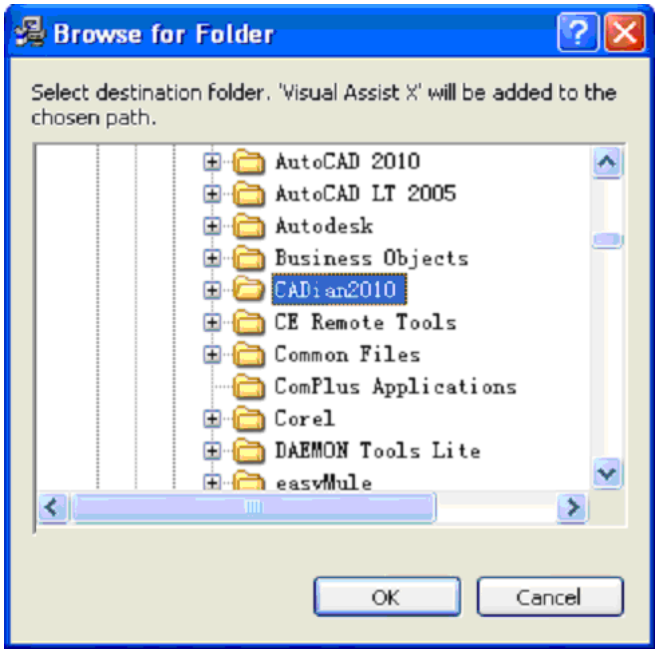
2.4 The Plug-in of Cadian Installed

Cadian plug-in are now available for the non-simplified of Cadian2010. The other version is

not tested. When Cadian was installed, you should close the running Cadian procedures.

Run Setup. Select “CaDian Laser” as the “Type”. And then click 【Install】.

As CaDian is green software, installation program can not automatically find the installation directory where the need to manually locate the installation path. Select the CaDian installation folder, and click “OK” button.



After installation is complete, the following dialog box appears.

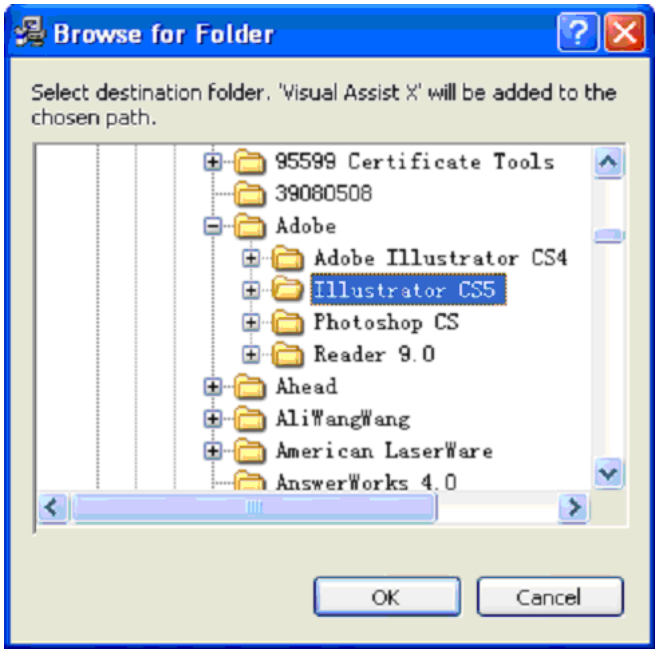
Exit the installation program, and run CaDian.

2.5 The Plug-in of Illustrator Installed

Illustrator plug-in are now available for the non-simplified of Illustrator CS5. The other version is not tested. When Illustrator was installed, you should close the running Illustrator procedures.

Run Setup. Select “Illustrator_Laser” as the “Type”. And then click 【Install】.

As Illustrator is green software, installation program can not automatically find the installation directory where the need to manually locate the installation path. Select the Illustrator installation folder, and click “OK” button.



After installation is complete, the following dialog box appears.

Exit the installation program, and run Illustrator.

Chapter 3 Install USB Driver

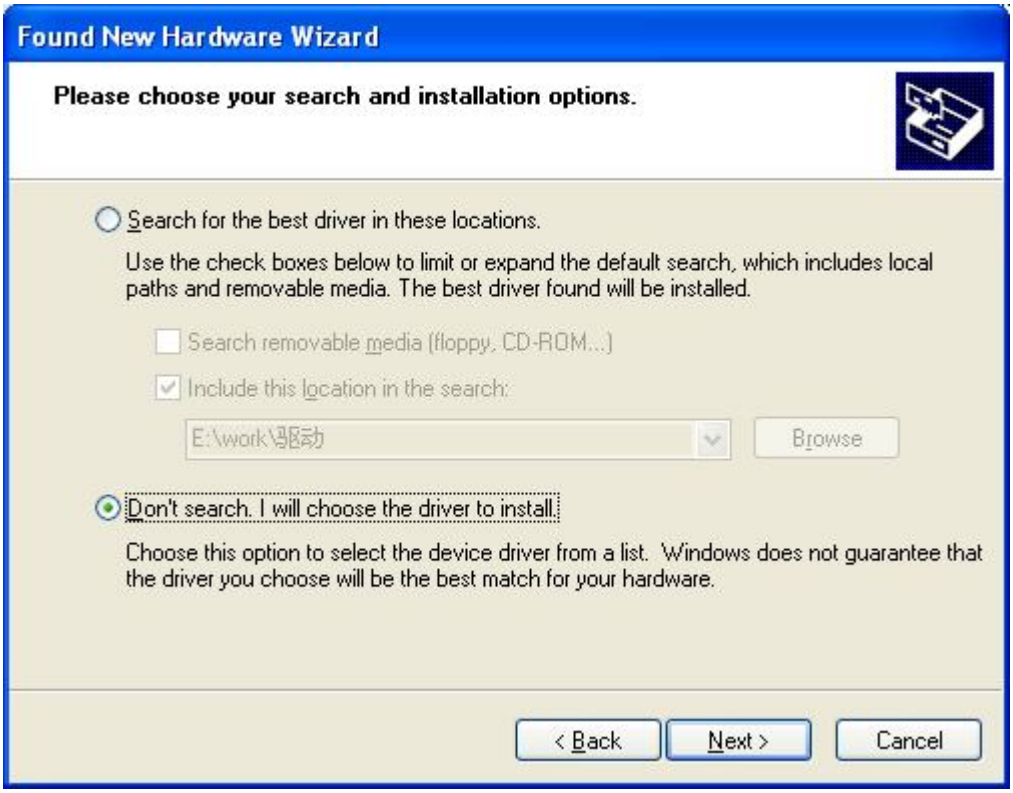
When the USB cable to the host, the operating system will be prompted to find new hardware and install the driver required.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
FT245R USB FIFO
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

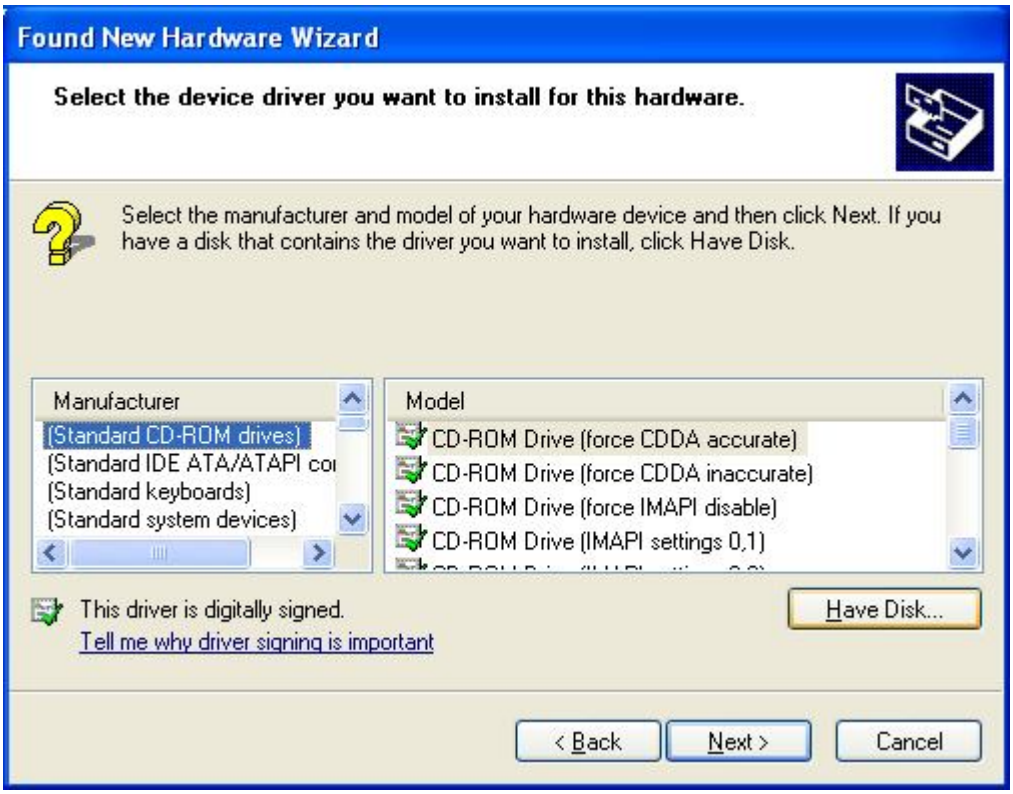
Select "Install the software automatically [Recommended]" and then select Next.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
FT245R USB FIFO
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

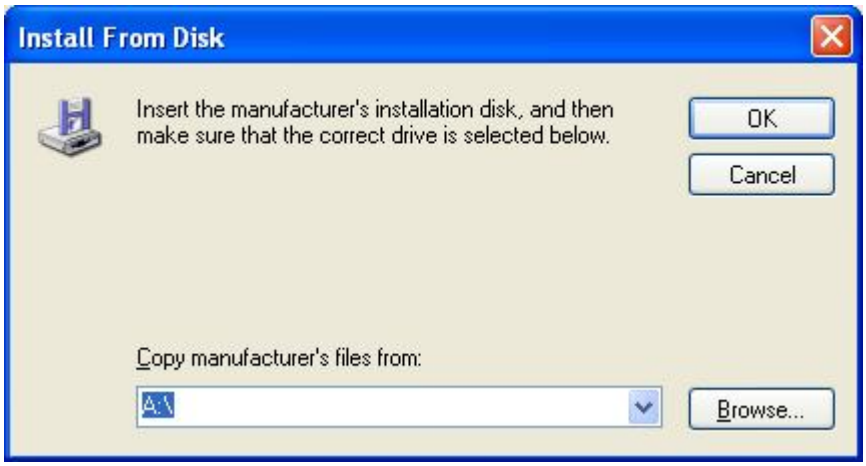
Or select “Install from a list or specific location” and then select Next.


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
E:\work\驱动
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

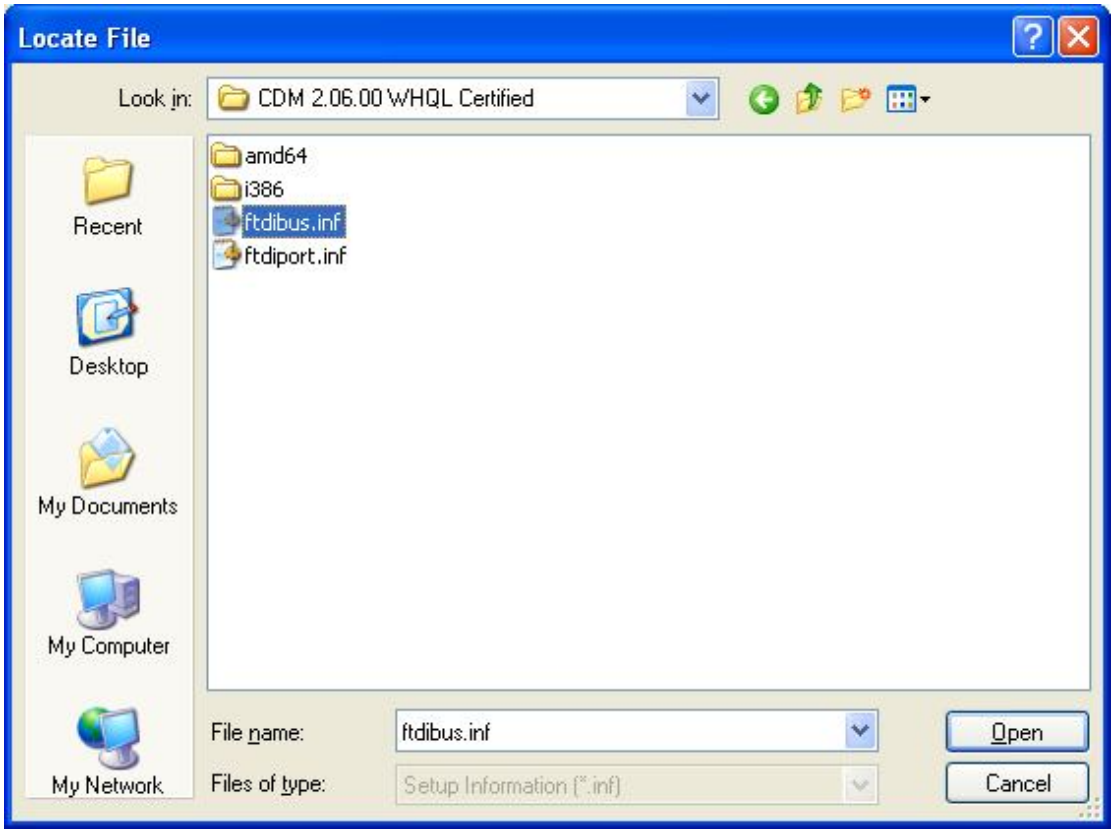
Select “Do not search, I will choose the driver to install” and then select Next.


Found New Hardware Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Manufacturer
(Standard CD-ROM drives)
(Standard IDE ATA/ATAPI co
(Standard keyboards)
(Standard system devices)
Model
CD-ROM Drive (force CDDA accurate)
CD-ROM Drive (force CDDA inaccurate)
CD-ROM Drive (force IMAPI disable)
CD-ROM Drive (IMAPI settings 0,1)
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

Click button “Have Disk”.



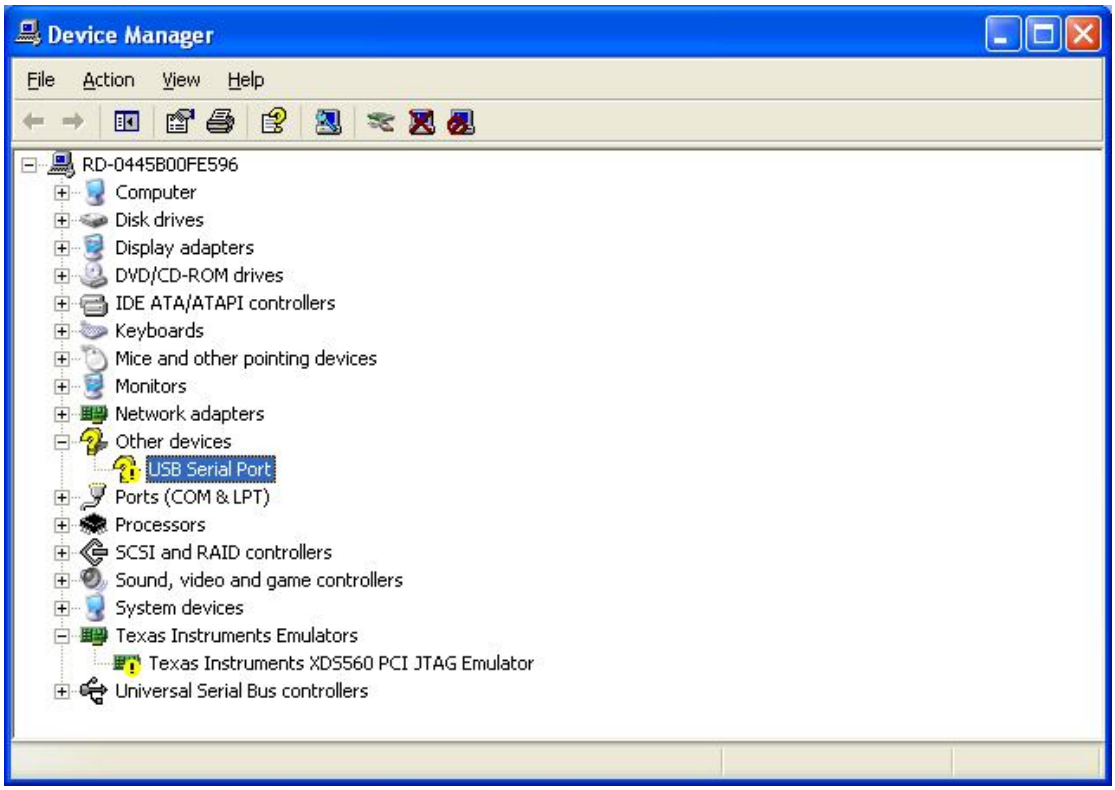
Select the “Browse”, navigate to the directory where the folder drive.



Select the file ftdibus.inf, then OK, and in the “Found New Hardware Wizard” dialog box, choose “Next”.

Found New Hardware Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Show compatible hardware
Model
USB Serial Converter
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

After the installation process, within the Device Manger will show “USB Serial Port”.



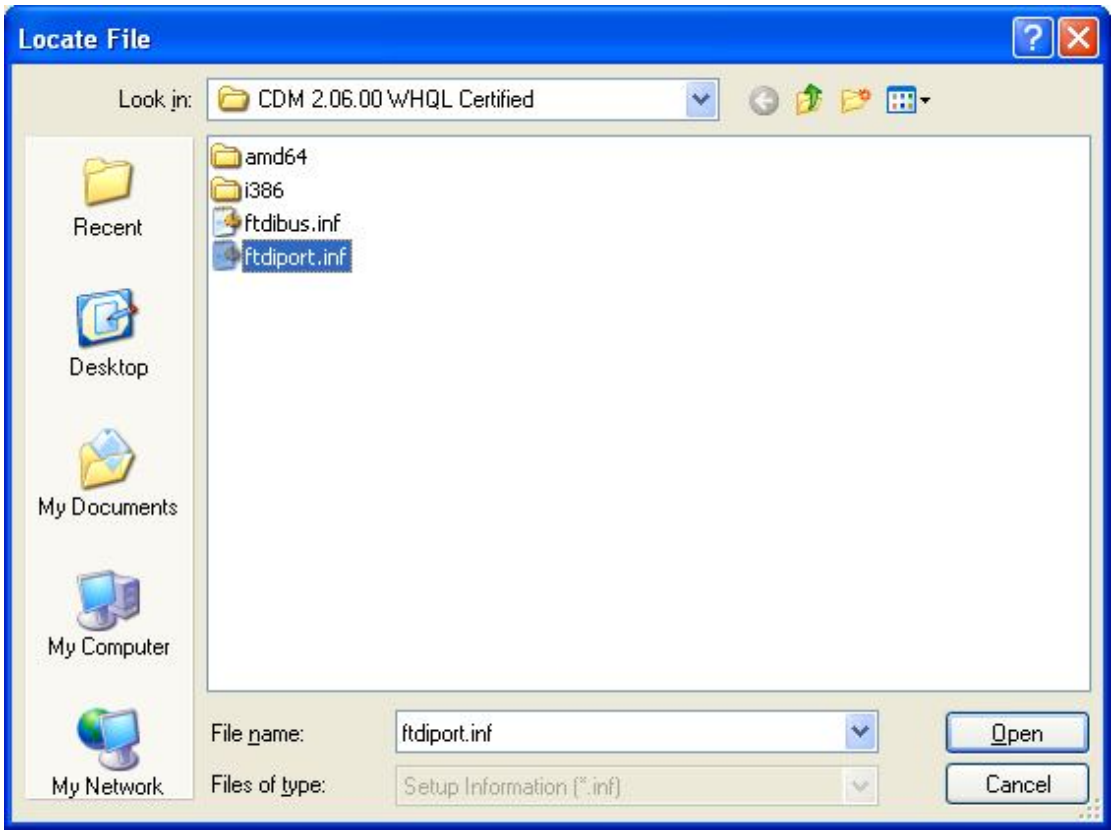
Operating system will still be prompted to find new hardware wizard.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
USB Serial Port
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

Select “Install from a list or specific location [Advanced]” and then select “Next”. The remaining operation is consistent with the foregoing. Until the following dialog box appears.

Found New Hardware Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Manufacturer
(Generic USB Audio)
(Generic USB Hub)
(Standard CD-ROM drives)
Model
BCM5701 Gigabit Ethernet
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

Select “Have Disk”, and manually navigate to the driver to the driver location, select the file ftdiport.inf.

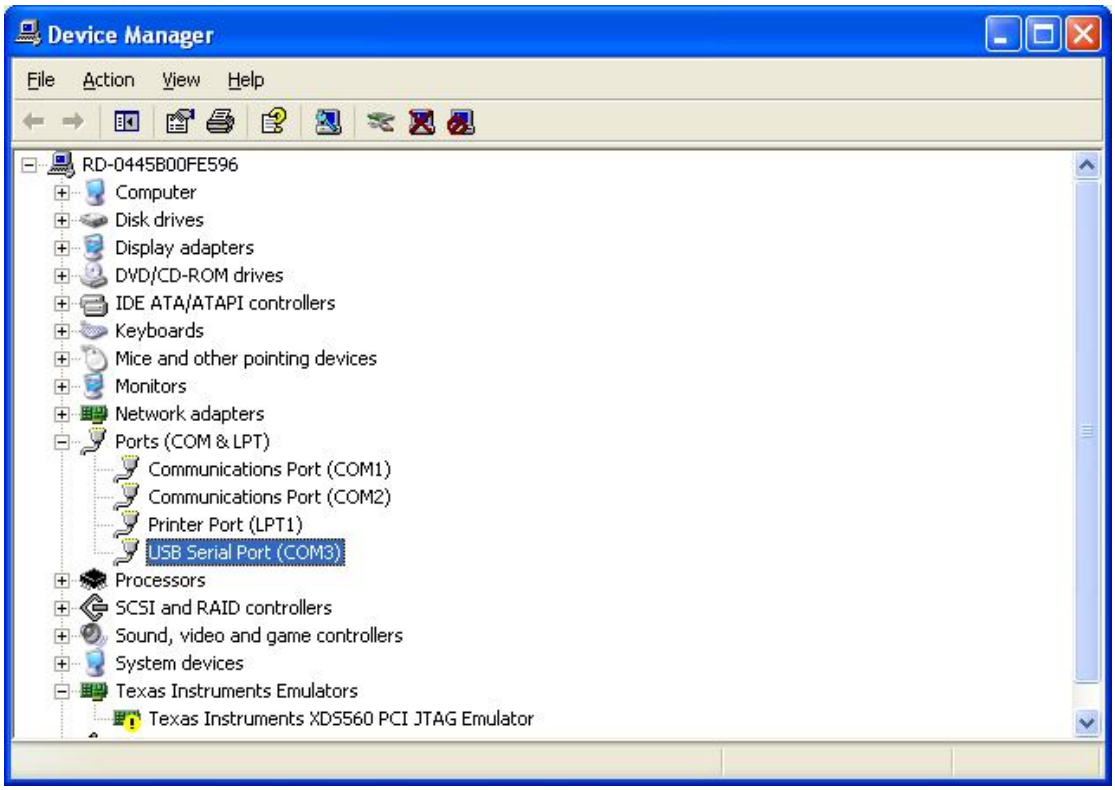


Found New Hardware Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Show compatible hardware
Model
USB Serial Port
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

Then select “Next”, the operating system will automatically install the driver.

After installation, the prompt window appears.

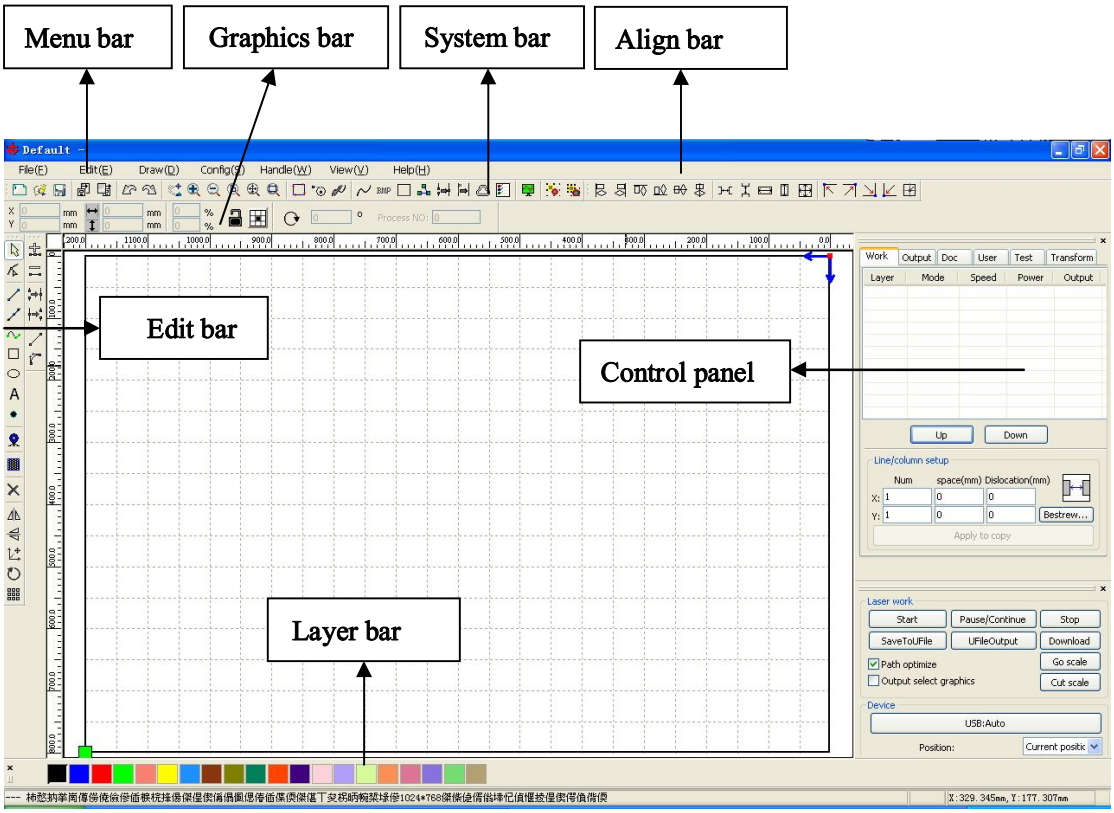
View Device Manager once again. The port number of the COM appears in the following of the "USB Serial Port". Specific values relate with the status of the system port.



Chapter 4 Software Basic Operation

4.1 The Main Interface Operation

After start the software, you can see the interface shown in the following figure.



Menu Bar：The main function of this software are available through the implementation of the Menu Bar. Execute the menu command is the most basic mode of operation. Menu Bar including: Document、Edit、Draw、Setting、Processing、View and Help.

System Bar: On the System Bar, placed some most commonly command buttons which is chosen from the menu.

Graphics Bar: Graphics property bar is the basic attributes of graphics operations, including graphic location, size, scale, number processing.

Edit Bar：The Edit Bar default on the left of the work area. In the Edit Bar placed frequently used tools to make the operation more flexible and convenient.

Align Bar：Alignment of the selected objects。

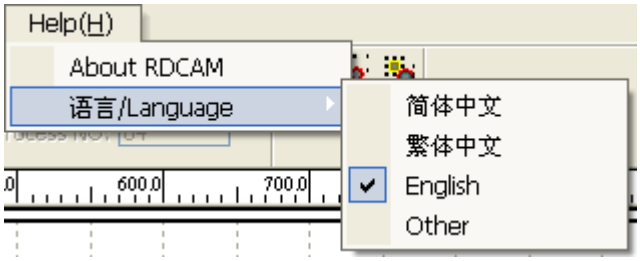
Layer Bar：Change the layer of the selected objects。

Control Panel：Using the Control Panel to complete laser processing of multiple tasks, Layer parameter settings, axis control, processing …etc.

4.2 Language Settings and Manufactures Information

In addition to installation process can set the software language type, you can easily switch in different language.

Click Menu Bar【Help】->【语言/Language】expand menu，select the required language types.

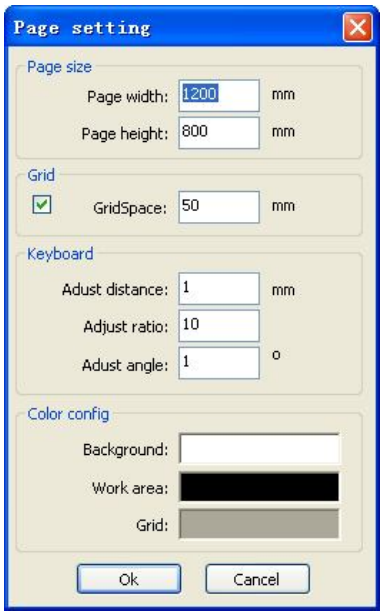


To obtain manufacturers information,so that we can provide you with better service. Click Menu Bar【Help】->【About RDCAM】

How to set manufacturers, refer to 《Chapter 2 Software Installation》

The bottom of the dialog box shows the current software version number. As different versions of software may be have some differences on the functions and interfaces, you can easily contact and communicate with manufacturers through software version number.

4.3 Page Setting



Click Menu Bar【Config】->【Page setting】the following dialog box appears：

【Page width】：Software page width, usually associated with machine X breadth。

【Page height】：Software page height，usually associated with machine Y breadth。

Under normal circumstances, if you have connected to the motherboard, software will automatically format for the current work of the machine, as a page size.

If the board is not connected, or need their own custom page size (such as to set the page size by material), you can use the page setting to reconfigure the page size.

【Grid】

Setting gird space and whether enable grid.

【Keyboard】

User can use arrow key to moving or rotating the selected graphics.

【Color config】

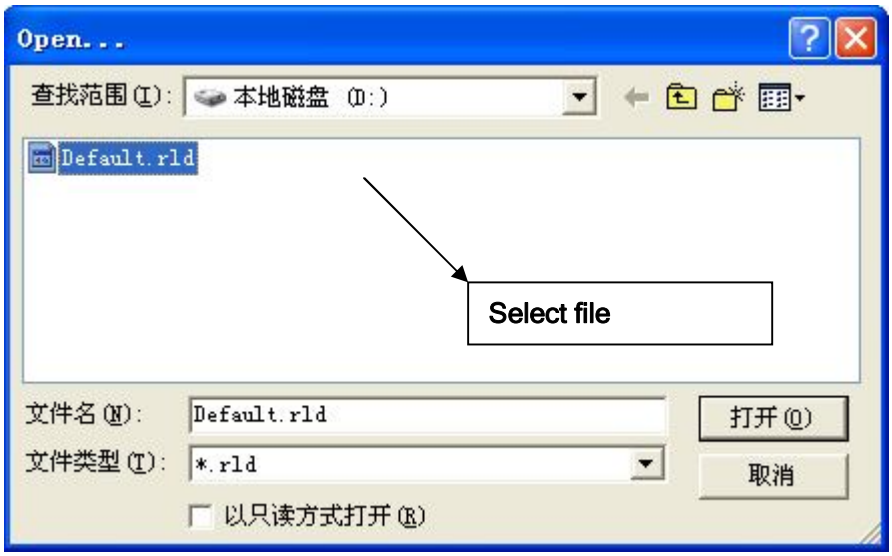
Setting the color of the work area.

4.4 File Open and Save

The software uses rld file format to save graphic information、layer parameters of various layers and processing sequence of the graphic elements.

4.4.1 Open File

Click menu【File】-> 【Open】,or click icon, the following dialog box appears：



（2） Select file (e.g. Default.rld), click【Open】。

4.4.2 Save File

（1）Click menu【File】->【Save】,or click icon,the following dialog box appears：

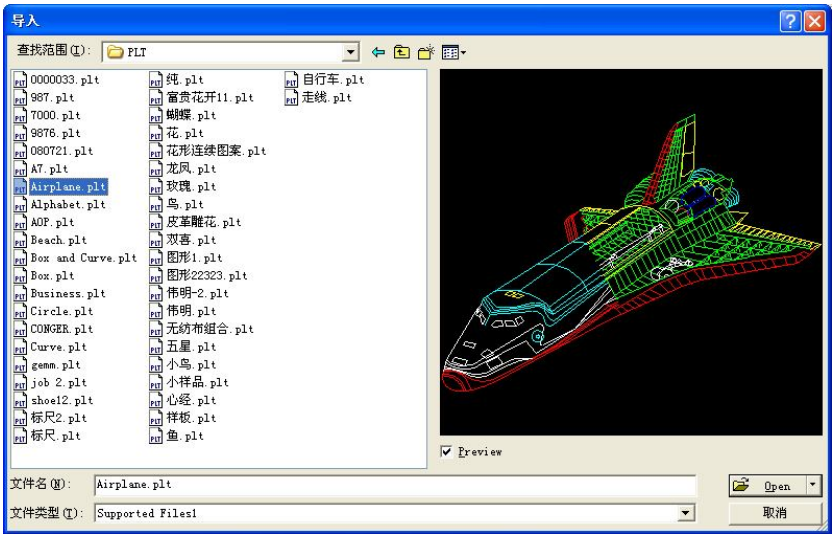
（2）Enter the file name in the edit box，then click【Save】。

4.5 File Import and Export

Because this software is rld format, so to make or edit the use of other materials will be done by importing. After using the Export to graphic files for other software.
Supported file format for import : dxf, ai, plt, dst, dsb...etc
Supported file format for export: plt

4.5.1 File Import

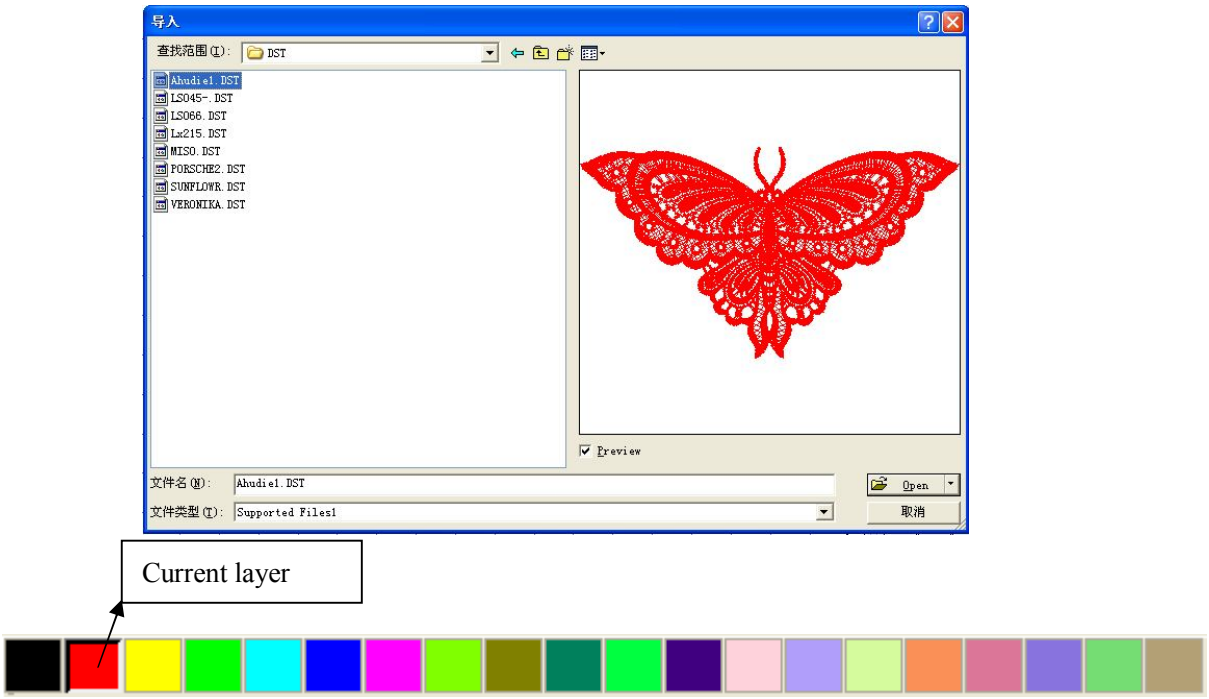
Click menu【File】->【Import】, or click icon 。The following dialog box appears. Select file,and click【Open】。



◆ Select【Preview】, the selected file can be shown.

For most vector file,data automatically imported into the corresponding layer of RDCAM software according to the layer description.

For some special documents such as DST/DSB, data will be imported into the current layer.

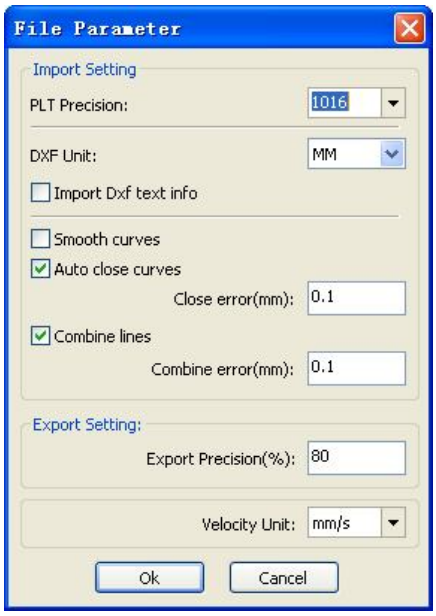


4.5.2 File export

Click menu【File】->【Export】or click icon 。The Export dialog box appears.

Input file name,and click button【Save】.

4.5.3 File Parameter Setting



PLT Precision: According to the accuracy of the original plt file to select the appropriate import unit.

Smooth curves: When import vector file, automatically smoothing the original curves. For the original graphic is smooth or need to repeatedly adjust the beset smoothing effect, you can uncheck this button. Do not do smoothing curves may reduce time of import processing.

Auto close curves: According to close tolerance automatic check and closed curve

Combine lines : According to merger tolerance, auto-connecting curves.

Color map automatically switch to grayscale: Because under normal circumstances, graphics are

based on grayscale. If the imported bitmap is a color image can be converted to grayscale.

Import Dxf text message：When the user need only Dxf the graphic information, not need the text information within the file, do not check this.
Export precision: The precision of export plt file or output file.
Velocity unit: Software supported two types of speed unit: mm/s、m/min. Selected according to usage. After it was selected, the speed of parameters on the interface unit will change with it.

4.6 Basic Graphics Creation

◆ **Line**

Click menu【Draw】->【Line】, or click Edit Bar ,drag the mouse on the screen you can draw an arbitrary line。Press the "Ctrl" key while dragging the mouse to draw horizontal or vertical line.

◆ **Polyline**

Click menu【Draw】->【Polyline】, or click Edit Bar 。Drag the mouse on the screen you can draw an arbitrary polyline.

◆ **Rectangle**

Click menu【Draw】->【Rectangle】, or click Edit Bar 。Drag the mouse on the screen you can draw an arbitrary size rectangle.
Press the "Ctrl" key while dragging the mouse to draw square.

◆ **Ellipse**

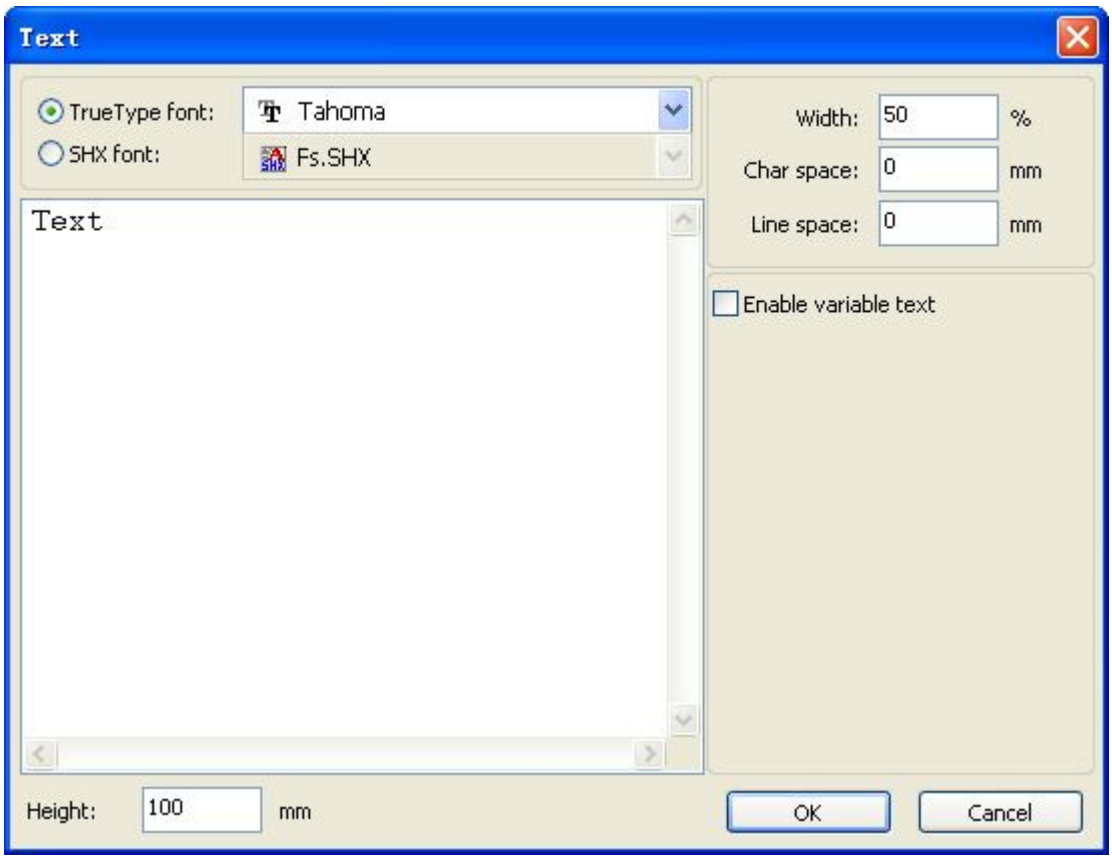
Click menu【Draw】->【Ellipse】, or click Edit Bar 。Drag the mouse on the screen you can draw an arbitrary size ellipse.
Press the "Ctrl" key while dragging the mouse to draw round.

◆ **Point**

Click menu【Draw】->【Ellipse】, or click Edit Bar . Click the mouse on the screen, you can draw an point.

◆ **Text**

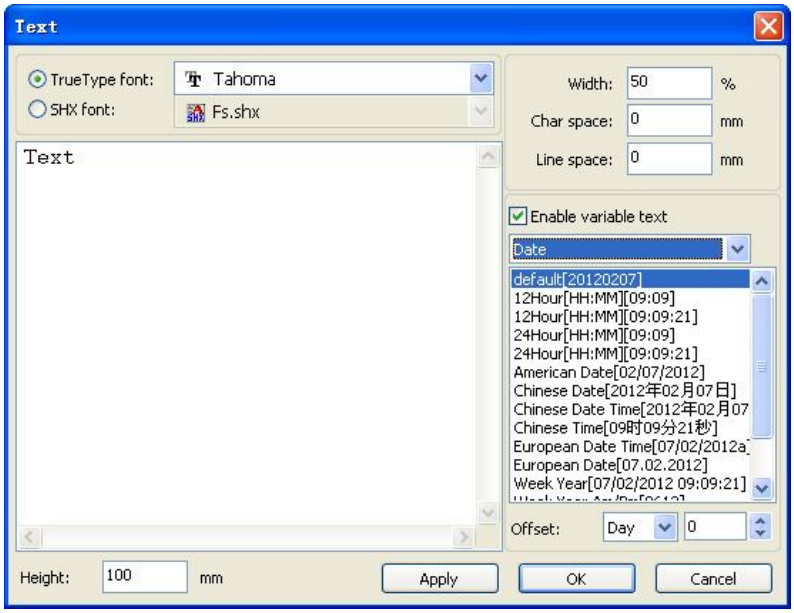
Click menu【Draw】->【Text】, or click Edit Bar 。And then in a drawing area any position click, pop-up text input dialog box.



Choose font word, input text word, then set high , wide, word spacing, line spacing. Click again 【OK】.

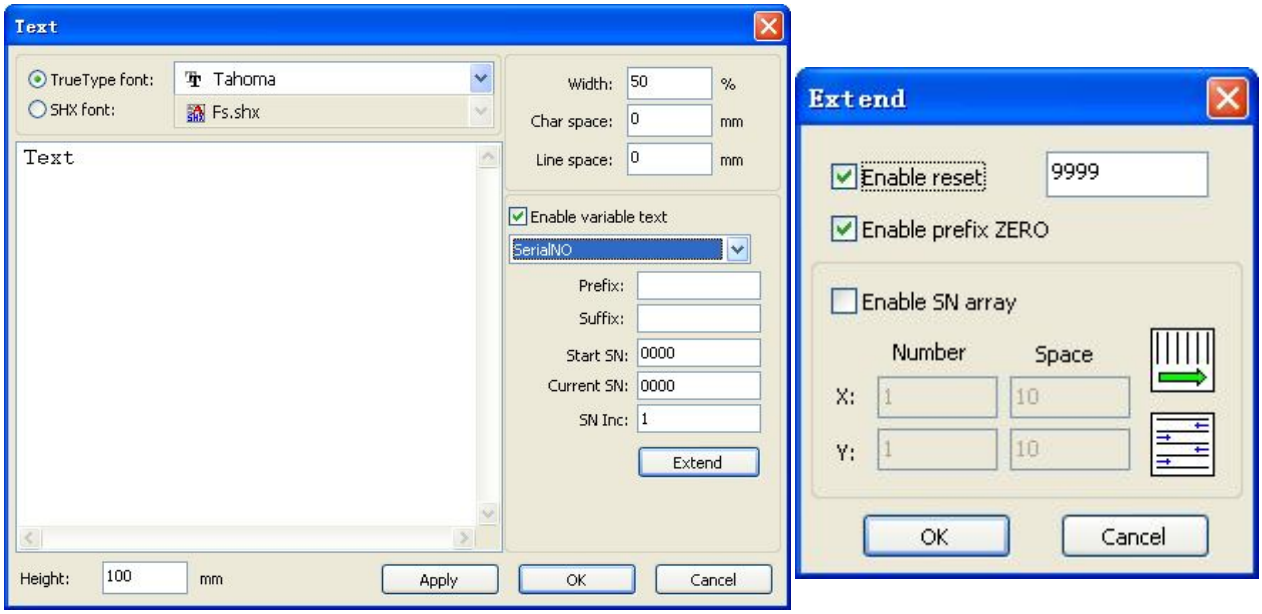
The software also supports variable text, the so-called variable text, the text is need according to certain rules change, every output processing time, text to be automatic change again. For the system variables have character type date variables and serial number.

Variable is the date when the current every time processing take the current system of computer time output. Software offers a variety of date format for customers to choose.



Users can also set the date migration, have the day by the month according to the years 3 kinds.

As in packaging carved on the expiration period can use the product.



If ABC0001DEF processes repeatedly, ABC0002DEF, ABC003DEF until ABC9999DEF a group of serial number.

【Prefix】 : serial number prefix, example ABC is leading string.

【Suffix】 : the serial number of the suffix, example DEF is the string after.

【Start SN】 : from which a specified number start manufacturing, example is to start to 0001 serial number.

【Current SN】 : the current processing to which, serial Numbers, can also be used to specify the current to processing which serial number. As in the processing a group of serial number, leakage processing the one, but through the designated the current serial number to make processing, not set start, serial Numbers, because in some cases a group of serial number requires repeated processing, namely to a serial number, need to go back to the start serial number start manufacturing.

【SN Inc】 : the interval number can be prescribed sequence number. Example will in turn processing from 0001 to 9999 serial number, the increment is 1.

If only need to output even or odd number serial number, can set incremental is 2.

【 Enable reset】 : when serial number processing to reset the serial number, 【current SN】 will be automatically reset to 【start SN】.

Example requires repeated processing from 0001 to 9999, serial Numbers, so can be designated 9999 as reset, serial Numbers, when processing the 9999 serial number, text will automatically change to 0001.

【 Enable prefix ZERO】 : if not lead to zero, the system will automatically remove the first in the serial number of zero digital before the zero. Such as the example, serial Numbers, if not the leader's zero can ABC0001DEF will become ABC1DEF. But it is worth noting that, if we want to output serial number is ABC1DEF, ABC2DEF until ABC9999DEF, we can't through the will 【start SN】 set to 1 to achieve, but through the cancel 【 Enable prefix ZERO】 to achieve, this is because set in the specified number from the start the serial number which one, beginning outside, also specifies the number of significant digits, such as will begin to serial number set to 1, the change of the serial number order is: 1,2,3,4,5,6,7,8,9,0,1,2,3,4,5... Serial number won't change

to 10, because the effective a serial number had 1.

【 Enable SN array 】 to the array of way, one-time processing more serial number.

for instance:

0001 0002 0003	after this batch processing serial number,	0015 0014 0013
0006 0005 0004	skip directly to the next group of	0007 0008 0009
0016 0017 0018		0016 0017 0018

◆ **Capture**

Click menu【Draw】->【Capture】, or click Edit Bar

If the computer has been connected to the image device, the dialog box will appear. After it was selected, you can collect the pictures from the specified device.

4.7 Object Selection

In the process of drawing and edit graphics, first of all is to select the object.

When the object is being selected, in the center of this object will have a shaped mark“ × ”, and surrounded by eight control points.

Click menu【Draw】->【Select】, or click Edit Bar , switch to status “Select”。Under this status, you can select object. The following are five kinds of method of selecting:

◆ Click menu【Edit】->【Select All】（Shortcuts Ctrl+A）, select all objects。

◆ Click mouse on the screen to select single object

◆ Select object using select box

Press the mouse and drag, as long as the box come into contact with the object will be selected。

◆ Increased select object/minus select object

Increase select：Press “Shift” key, click or box select to increase select object.
Minus select：Press “Shift” key, click or box select the selected object.

◆ Select object according to layer

Right-click the selected layer, then the part of all objects in the layer will be selected.

4.8 Object Color

The color of object that is the color of the object contour.You can click the color button on the Layer Bar to change the color of the object has been selected.The clolor of the pressed button is the color of current layer.

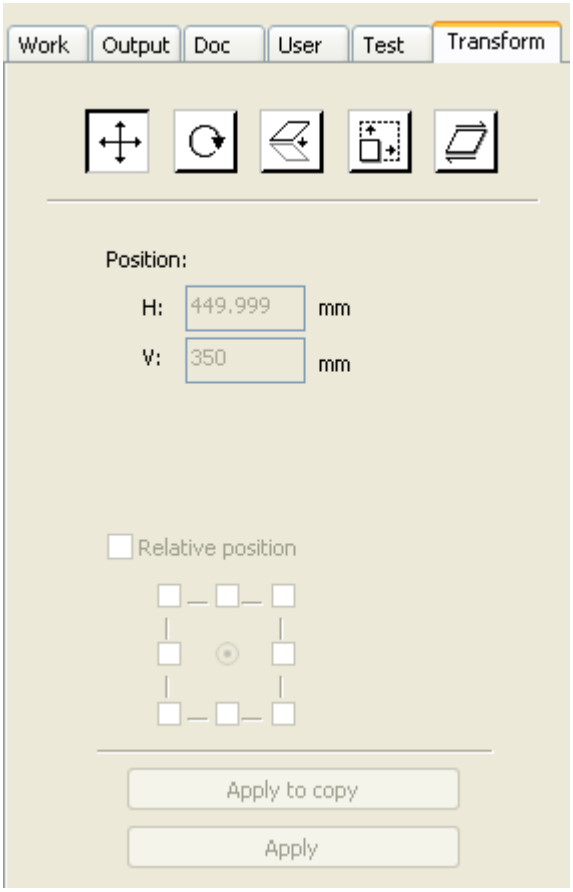
4.9 Object Transformation

Transformation of object mainly include: object location、orientation and size. But does not change the basic shape of the object and its characteristics.

Transformation of object for users, provides a convenient user interface. User can mirror and rotation through within the draw toolbar.

You can also use the Object Properties toolbar

You can also use the right transformation tools to transform and copy the graphics.

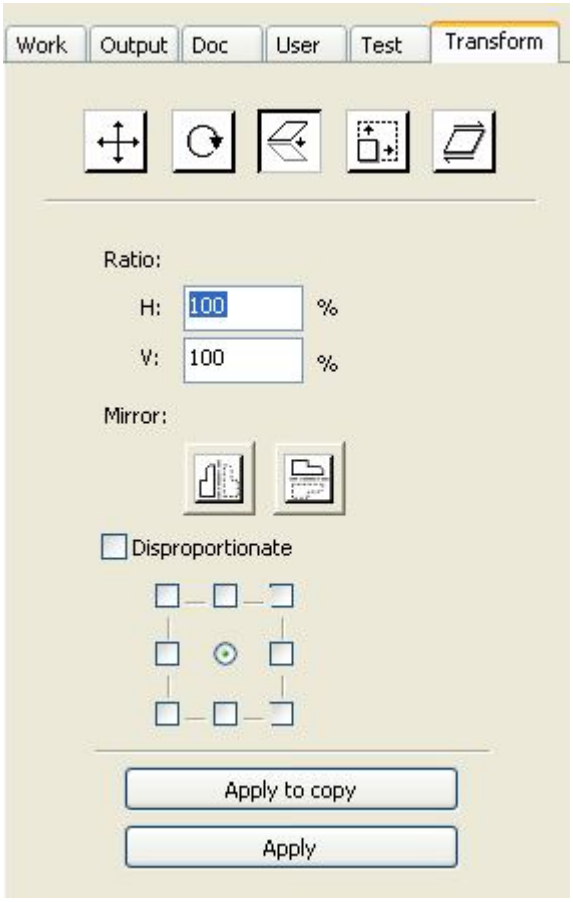


4.9.1 Object Image

Object image is flip the selected object in the horizontal or vertical direction.

Click Edit Bar , flip the selected object horizontal.

Click Edit Bar , flip the selected object vertical.



Or through the mirror to the transformation tools, horizontal and vertical mirror, and copy.

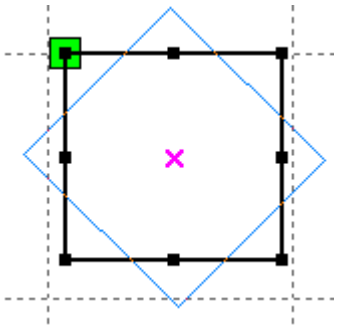
4.9.2 Object Rotate

Click Edit Bar ， will pop up the dialog of rotate angel setting.

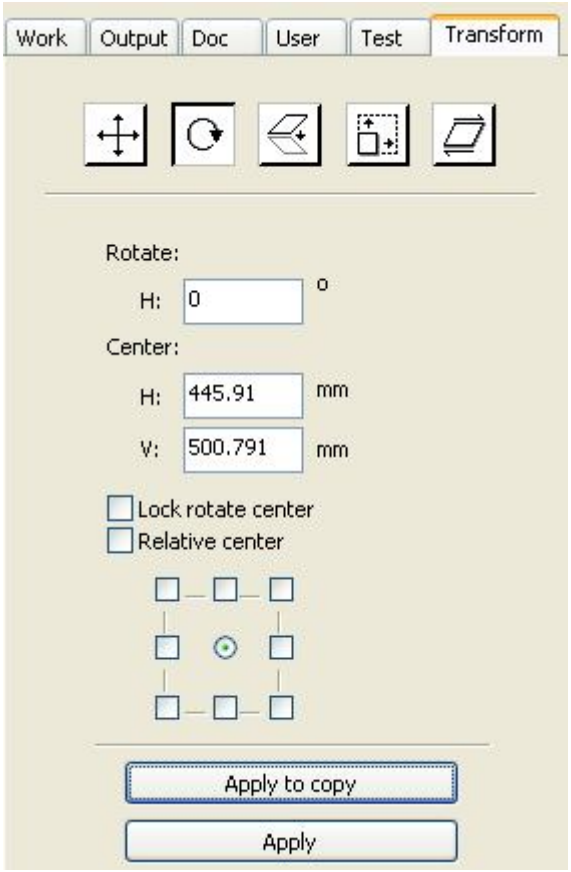
Set rotate angle and click the button【OK】.

If you want to drag rotation, set rotate angle 0,and determine.

Dragging the mouse to adjust the rotate angle, in the dragging process, there will be followed by rotating wire-frame outline.



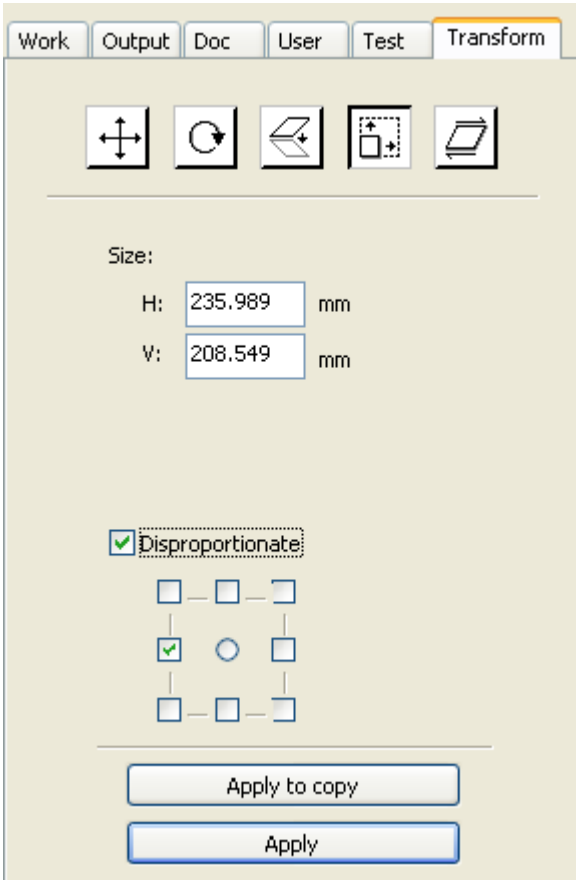
Or directly enter the rotation angle in the Object Properties toolbar.



Or use the spin rotation transformation tools to transform. In the rotations transformation tool can be set to the center of rotation and locking center of rotation.

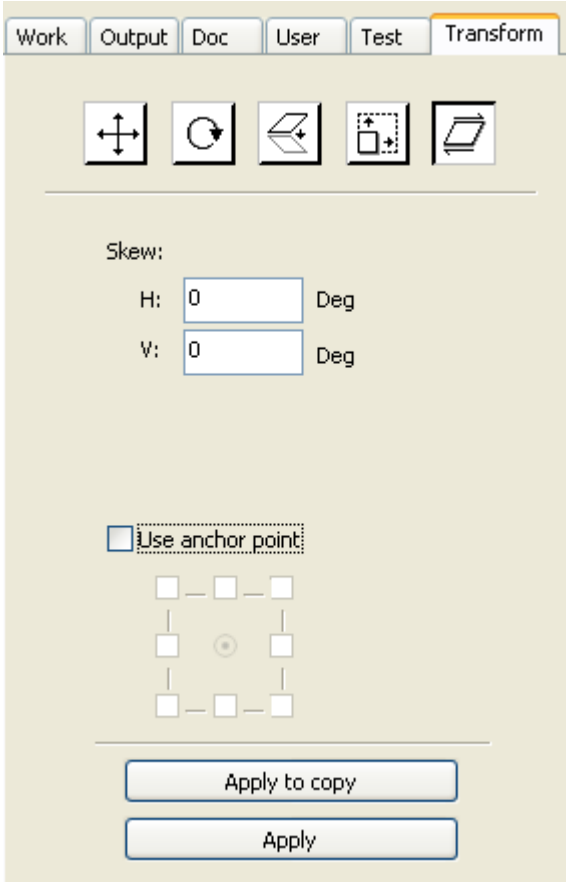
4.9.3 Object Size

You can set size and center position of the selected object.



Or use the size transformation toolbar to change the size of object. Can modify the size, choose whether to lock the aspect ratio, and set the position relative to the object to transform.

4.9.4 Tilt

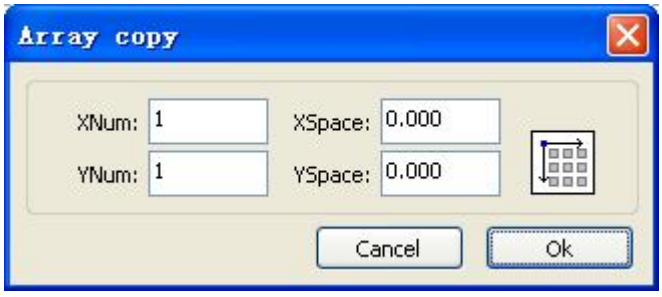


Object can be tilted by the tilting transformation tools. It can be set the tilt anchor and the tilt angle.

The tilt will cause distortion of the bitmap and the practical application of small, currently only supports the tilt vector graphics.

4.9.5 Object Array Replication

Click Edit Bar , select object wants to copy。Then click , the following dialog box appears：



Width of a single graphic(mm) Height of a single graphic(mm)

You can array replication object along different directions.The direction of copy is based on the orginal graphics.Such as choose the array direction lower right,then the original graphic will appear on the upper left corner.wheras if it is to the upper left array,then the original graph appears

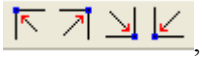
in the lower right.

After setting the array number and array spacing，click button【Apply】,you can see the actual graphics
array.
There are two forms of array spacing：center spacing and edge spacing.
Choose center spacing，then【X Distance(mm)】、【Y Distance(mm)】representing the distance of the two graphic center.
If not choose center spacing,then【X Distance(mm)】、【Y Distance(mm)】representing the distance of the graphic edge.
Center distance X = Edge distance X + width of object
Center distanceY = Edge distance Y + height of object
Switch between the two kinds of calculate method, 【X Distance(mm)】、【Y Distance(mm)】will be calculated automatically.
Click【Bestrewing breadth】，The software will automatically calculate the array number according to the workpiece sie、width、height、X distance and Y distance。
Adjust spacing can be directly input values,and click 【Apply】
Can also press the dirction keys to adjust objects spacing。
Check【Center】,then after object array replication,graphics will be centered on the work area.
Scroll the mouse wheel to zoom view of the graphics.
Drag the mouse to pan view of the graphics。

4.9.6 Place Object To The Origin

Place the object is to facilitate the view or orientation. The following tools are provided by software:

, selected object will be placed in the center of the page, that is the object center coincides with the center of the page.

 , Selected object will be placed on the page left, upper right, lower right, lower left, upper left corner of the object, upper right, lower right, lower left and upper left corner, top right, bottom right, bottom left corner of coincidence.

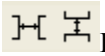
4.10 Object Align

Select objects , click tools on the Align Bar .

Whick include:

Left alignment、Right alignment、Top alignment、Bottom alignment

Vertical center alignment、Horizontal center alignment、center alignment

 Horizontal equidistance、Vertical equidistance

Same width、Same height、Same size.

Benchmark object：
If you press “Shift”key and select object one by one,zhen the benchmark object is the last object.
If you select object by select box,then zhe the benchmark object is the object which curve number in the final.

4.11 Object View

Move：Click menu【Edit】->【Move】，or click 。Then hold down the left mouse button in the drawing area，and drag pan.

Zoom Out：Click menu【Edit】->【ZoomOut】，or click 。Each click it，the drawing area zoom out once.Move mouse to the drawing area and click,each click,mouse position as center drawing area zoom out once.

Zoom In：Click menu【Edit】->【ZoomIn】，or click 。Each click it，the drawing area zoom in once.Move mouse to the drawing area and click,each click,mouse position as center drawing area zoom in once .

View Select：Click menu【Edit】->【View Select】，or click 。Move the mouse to the drawing area,hold down the left mouse button and drag，a dash border box will show in the drawing area,release mouse button，then the region in the dash border box will display in the drawing area with the largest proportion.

View Page Frame：Click menu【Edit】->【View Page Frame】，or click 。The page frame will full display.

View Data Frame：Click menu【Edit】->【View Data Frame】，or click 。The selected objects will full display

4.12 Group and Ungroup

Edit graphics, and sometimes need to be a part of the operation as a whole (such as multi-line text layout).

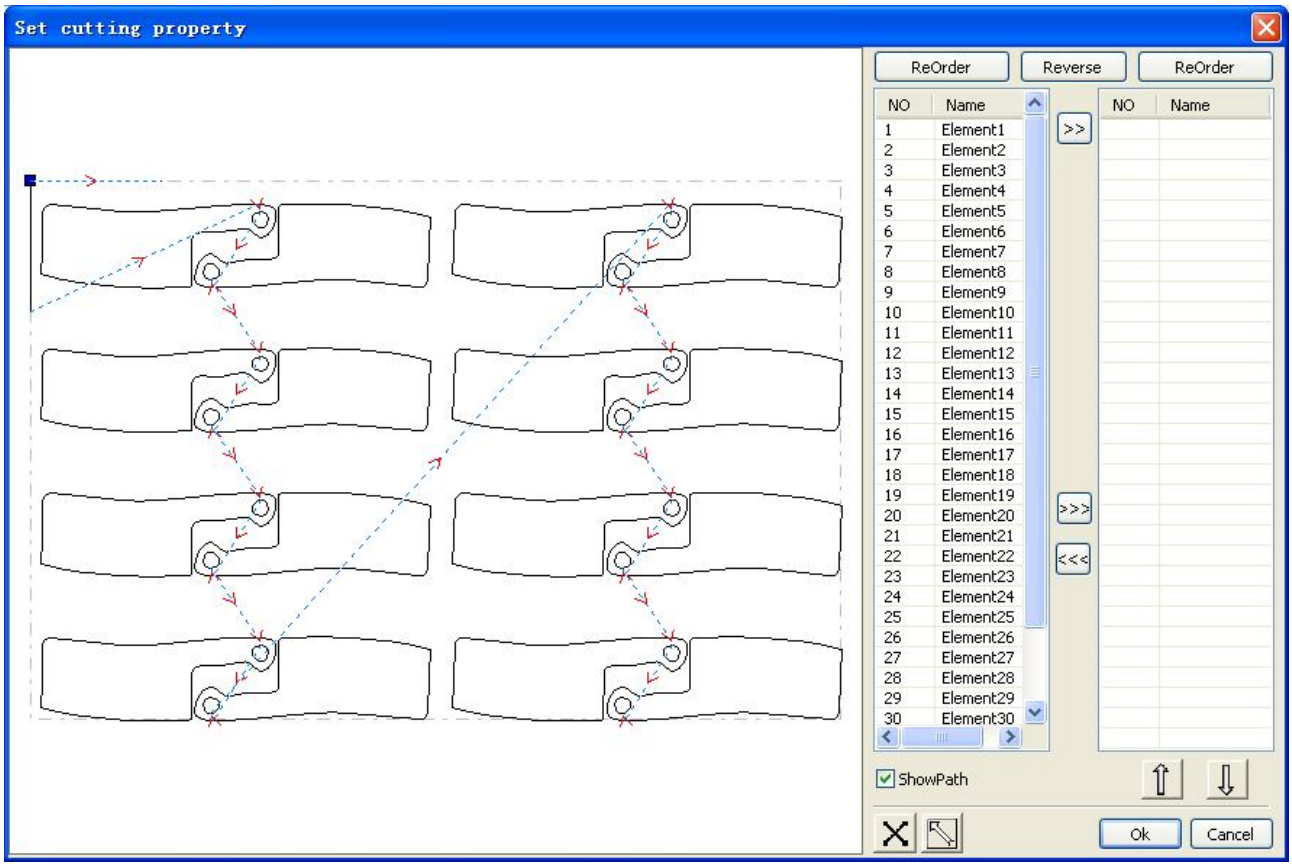
Method: Select the group of graphics, and then select the menu 【Edit】 / 【Group】 (【UnGroup】), or directly select the toolbar .

4.13 Important Tool

Here are some frequently used tools. Using these important tools, can make the current document in the graphics more orderly, and make the processing of output more fast.

4.13.1 Manual Sorting and The Set of Cutting Point and The Cutting Direction

Software provides users a convenient tool for the manual sorting. Select 【Edit】->【Set cutting property】. Cutting property dialog box will pop up. All with manual sorting, and cut points, cutting the direction of the settings in this dialog box can be completed.



Show path

First check the “show path”, it will display the current graphics cutting order and the cutting direction.

Manual sort

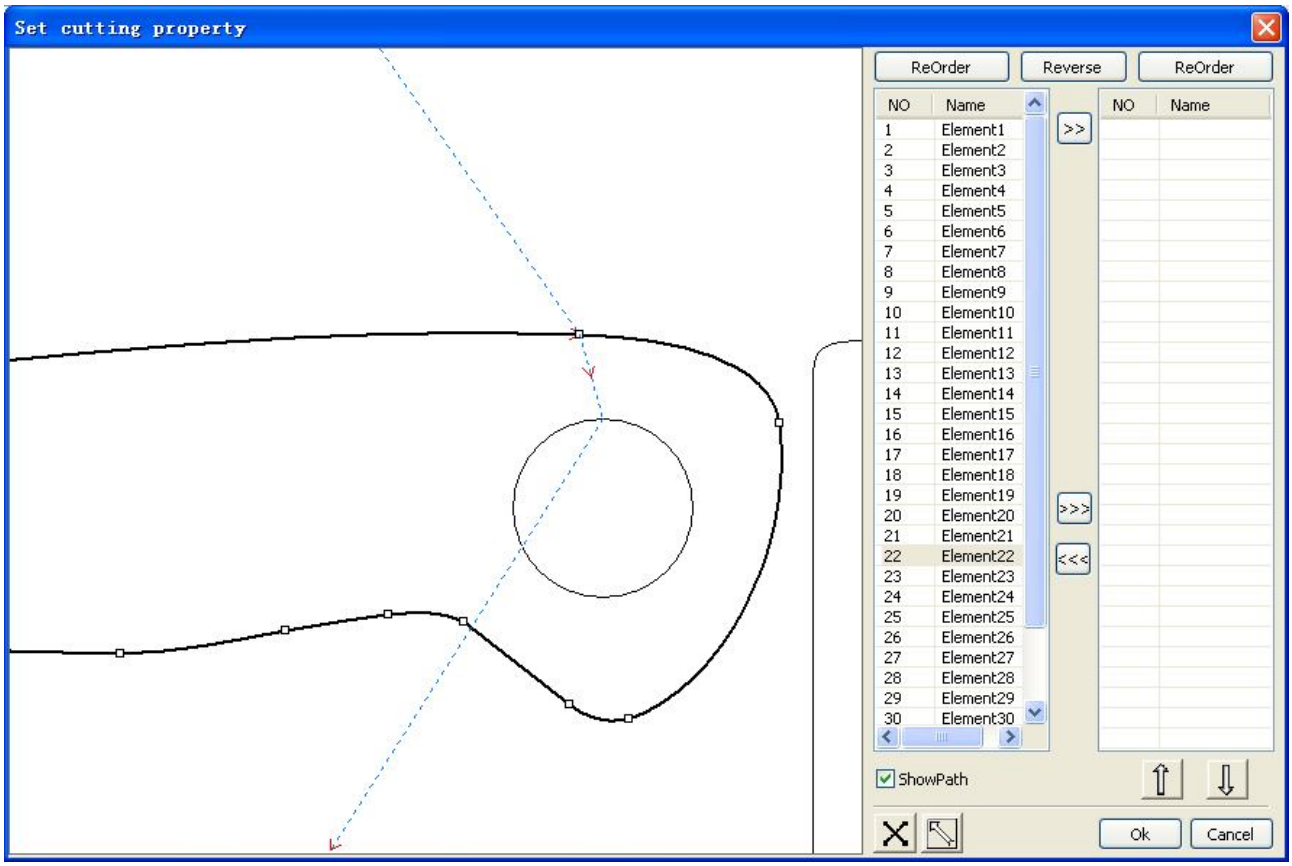
Select . This button is used to switch the current status of the operation is to edit or view. Then you can marquee or click the graphics in the graphics display area (or click one pixel or check many pixels). After selecting the graphic, select , these graphics to be redirected to another list, to be processed as the first primitive. Primitives followed by repeated operations, to complete sequencing of all graphics.

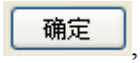
Change the direction of graphic processing

Mouse select the graphic in the graphics display area or in the list. And then click

.

Change the cutting point

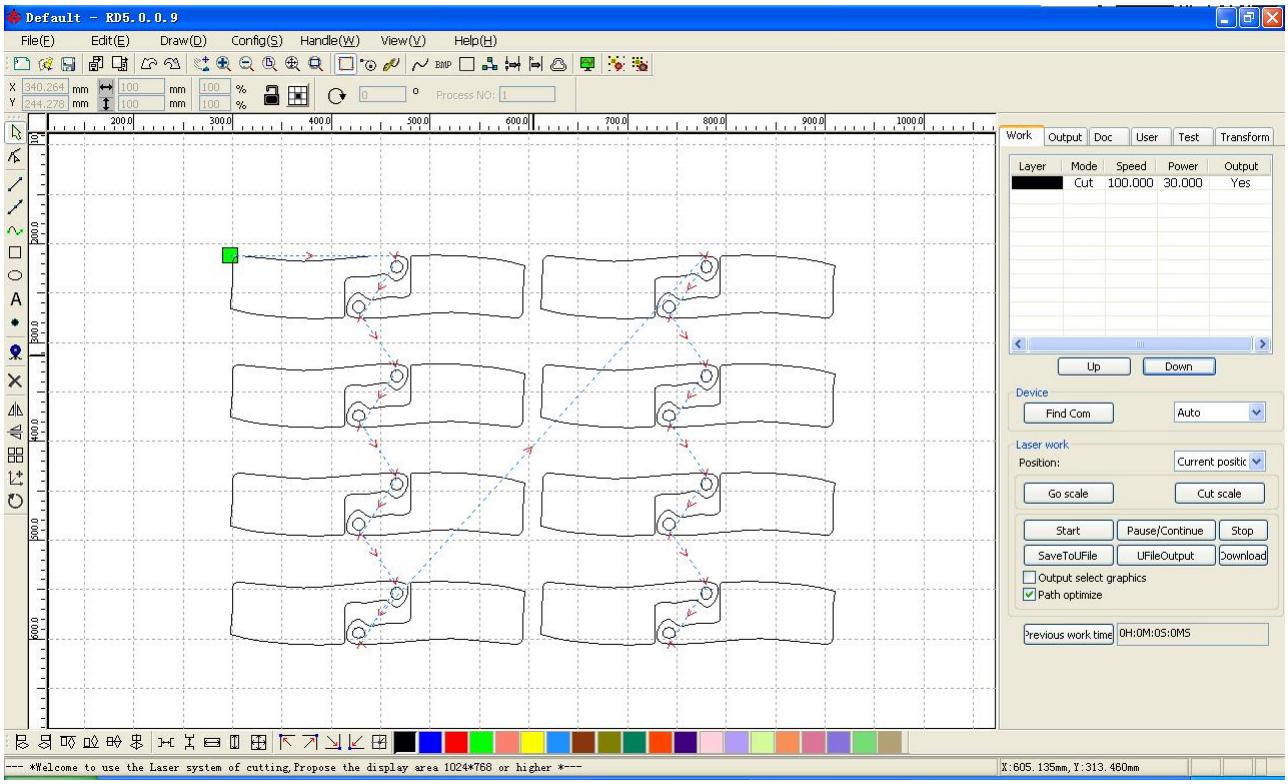


Select the graphics that should be changed the cutting point, it will show all the nodes in the current graphics. Select the starting point, double-click the mouse, it will change the starting point of the current graphics. After the completion of all changes, click 

, the result of the changes can be saved.

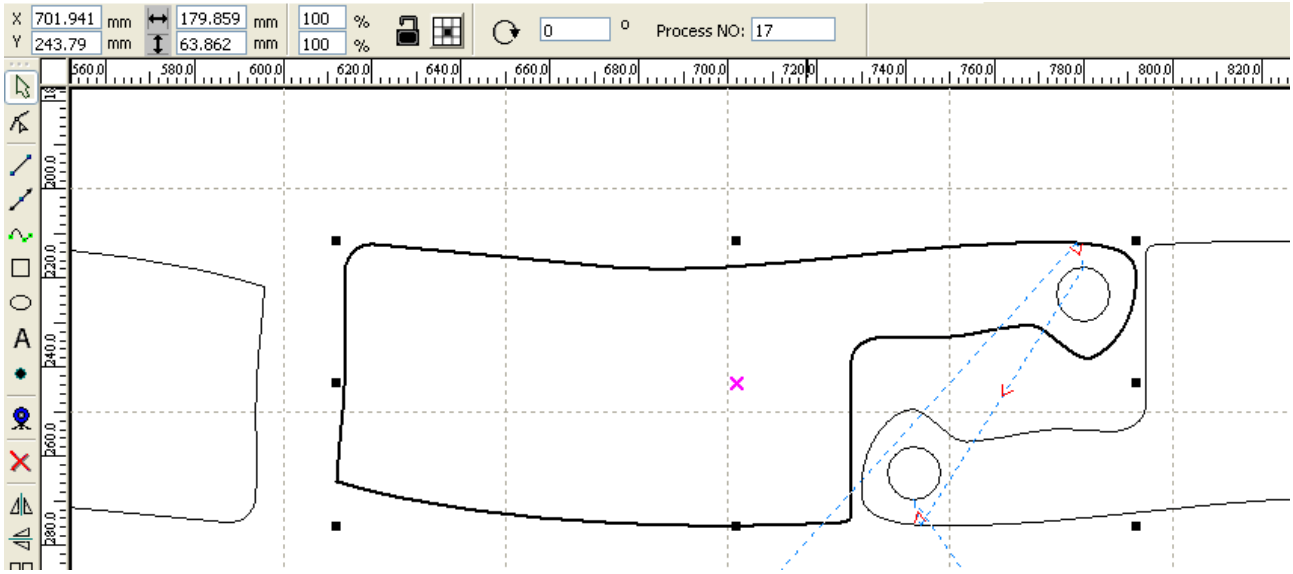
In addition to cutting property features, the software also offers some tools to change the cutting order, cutting direction and cutting point.

Select in the toolbar, or click the menu command 【Edit】->【Show Path】.



Manual sort

Choose the primitive that should be changed the cutting order, then the cutting serial number of the current primitive will display in the object properties bar.



Enter the serial number directly in the processing number, then press the keyboard “Enter” key, or click the plot area, the cutting order will be changed.

Change the processing direction

Click 【Edit】->【Set cut direction】, to enter the edit mode of the cutting direction. Then you can double-click on any position on the selected graphic.

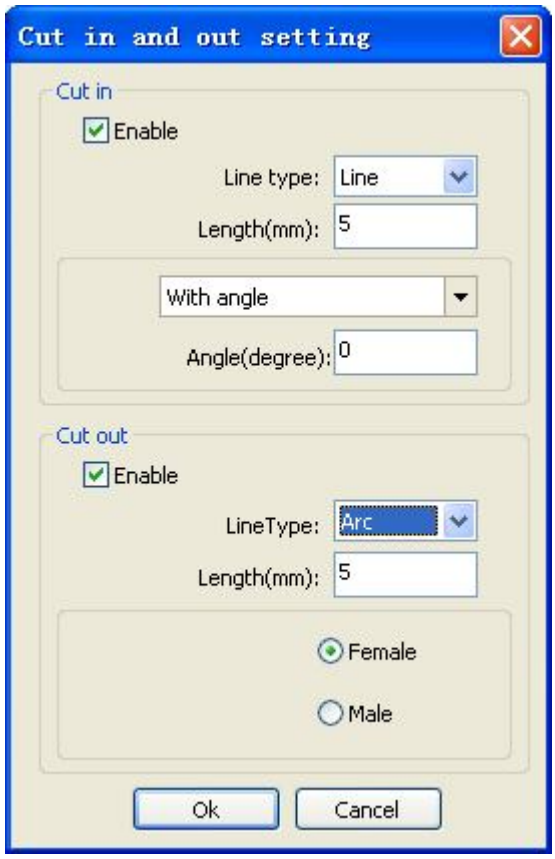
Change the cutting point

Click 【Edit】->【Set cut point】, to enter the edit mode of the cutting point. Then select the curve that should be edited, you can double-click on the node that you want to set the cutting point to complete the change of the cutting point.

4.13.2 Setting And Editing The Cut In/Cut Out Lines

Drawing or importing curves, the curve is default not have any cut in/cut out lines.

If want to add cut in/cut out lines,select the objects，then click【Edit】->【Edit cut in property】，or click .The following dialog box is appear.



To make cut in/cut out lines, first of all need to enable the cut-in/cut out function.

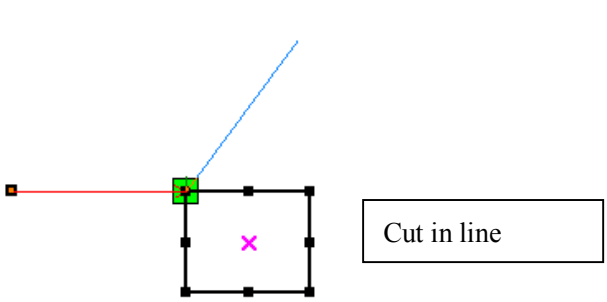
There are two types of the cut in/cut out lines: straight line and arc

Straight line cut in achieve through three ways:

Cut in with angle: cut in line and starting segment into a certain angle，counterclockwise angle is positive

Cut in at center，the starting point of the cut in line is at center.

Cut in from center，the direction of the cut in line is from center to starting point, and length is as setting.



The arc length of cut in arc is as setting.

There are two types of cut in/cut out arc， as shown in the following figure

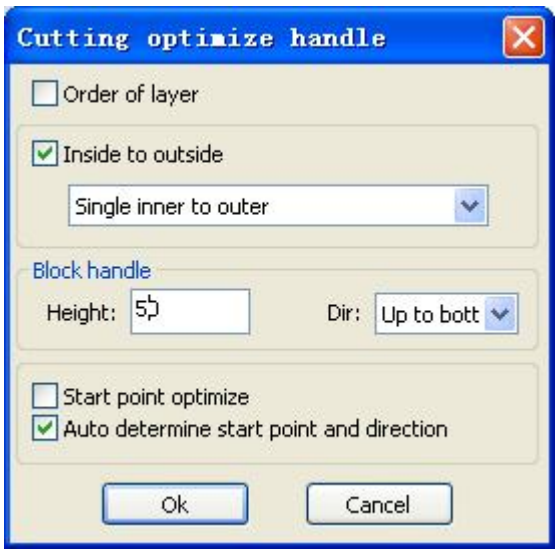
Female Male

The processing of setting cut out lines is same as cut in lines.

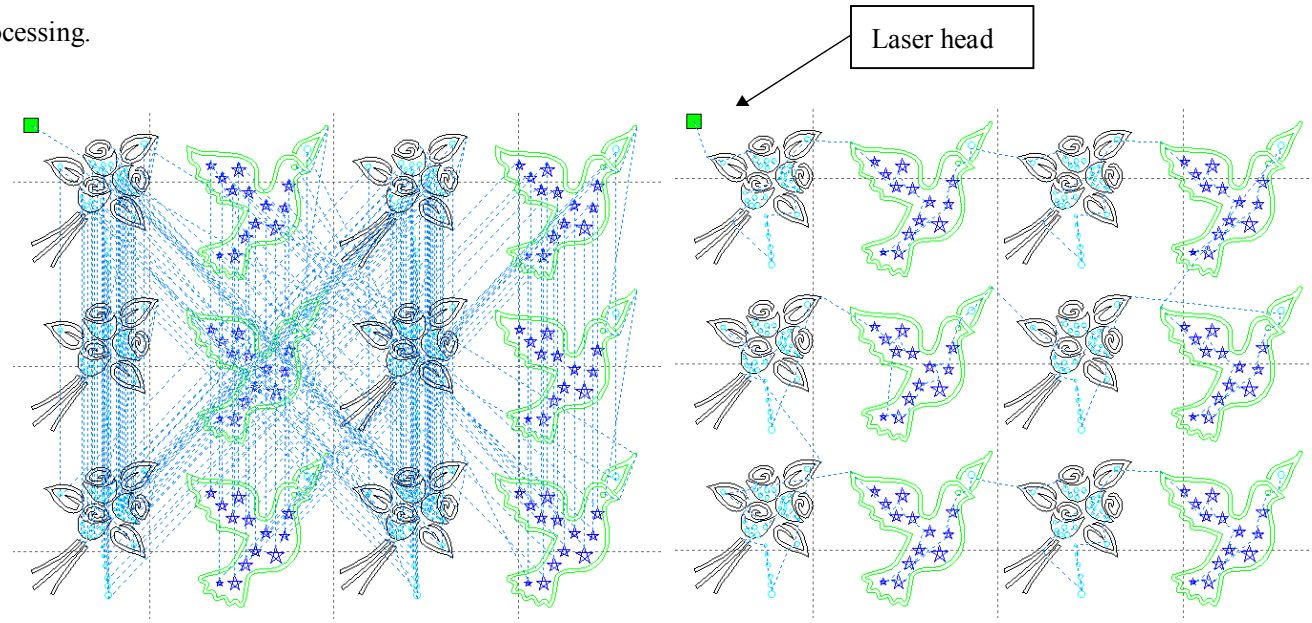
4.13.3 Path Optimization

Path optimization is primarily to re-order the vector graphics.

Click menu【Handle】->【Cut optimize】, or click ,the following dialog box is appears.



Click menu【Edit】->【Show Path】, or click , can see the cutting path before and after processing.



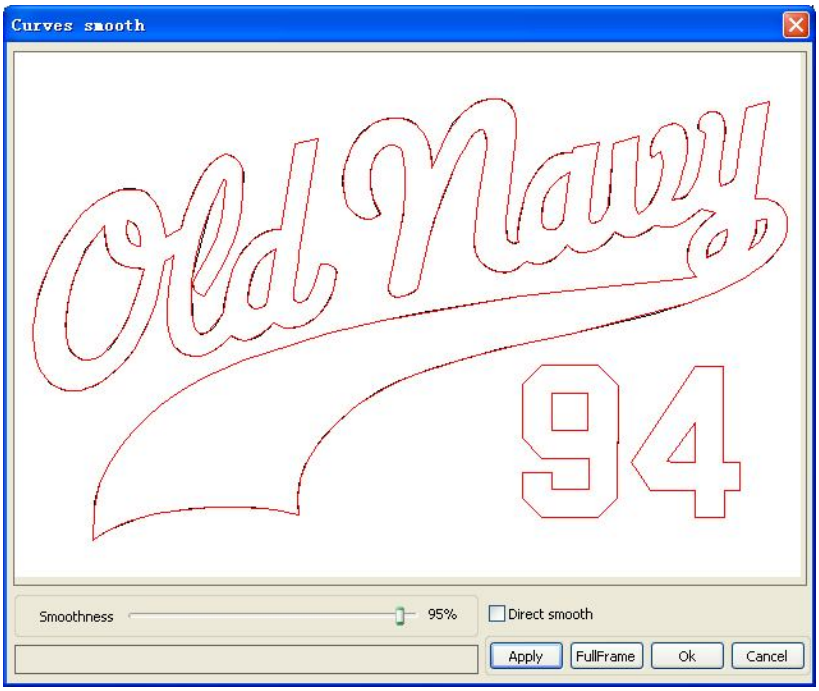
Before processing After processing

Graphics cutting path is always starting from the laser head。

4.13.4 Curve Smooth

For some less accuracy curves, this function can make curves more smoothness, and processing smoother.

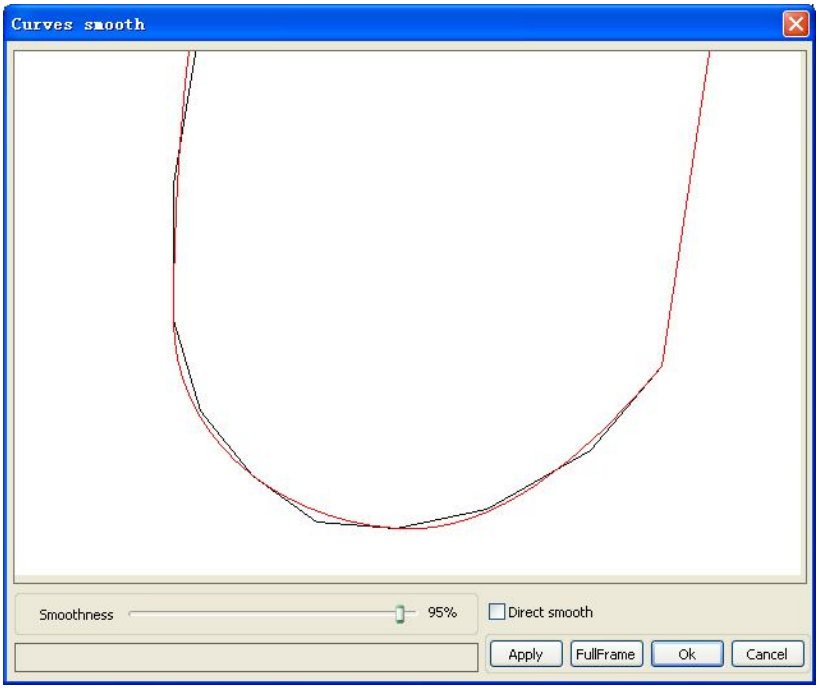
Click menu【Handle】->【Curve Smooth】, or click , the following dialog box appears。



Drag the smooth slider, and click button【Apply】, before smooth and after smooth curves will

all show in the dialog。

The black curves represent the original curves, and the red curves represent after smooth curves.



You can view the graphics with drag mouse.

You can zoom in/zoom out the graphics with scroll wheel.

Click button【FullFrame】, graphics will shown in the dialog box for largest.

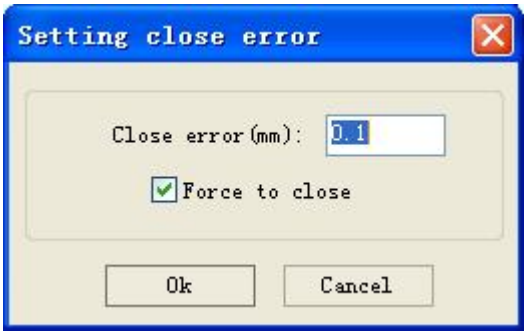
After get satisfied smoothing effect，click button【Apply】, curves will processing smooth according to smoothness settings.

Select “Direct smooth” , you can use another smoothing method.

The choice of smoothing method should be changed with the needs of the actual graphic.

4.13.5 Check Closure

Click menu【Handle】->【Curve auto close】, or click System Bar ,the following dialog box appears.

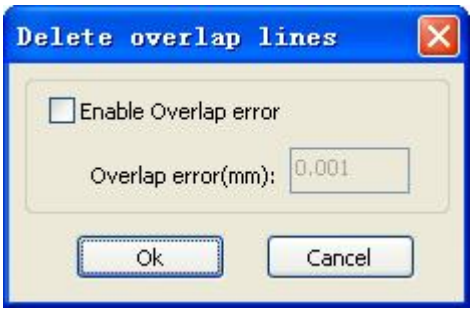


Close error: When distance from the starting point to ending point less than close tolerance, automatic closing of the curve.

Force to close: Mandatory closure of all selected curves.

4.13.6 Remove The Overlap

Click menu【Handle】->【Delete overlap】,or click ， the dialog box appear.



Under normal circumstances do not select the “Enable Overlap error”. Removing the overlapping lines when two lines are compared to a good degree of coincidence. If you need to delete overlapping lines, you should select “Enable Overlap error”, and set overlap error. Generally do not overlap error set too large, so as to avoid accidental deletion.

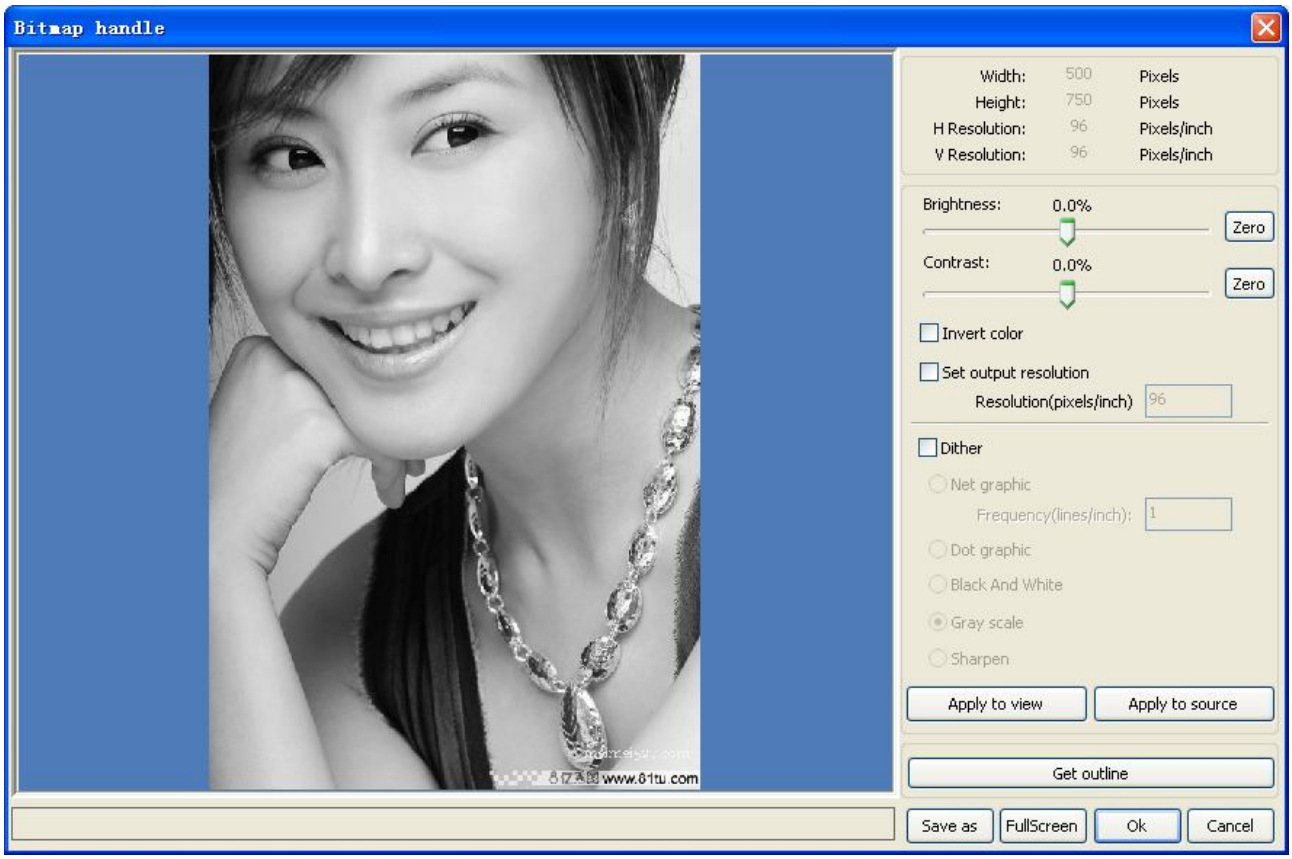
4.13.7 Combine Curve

Click menu【Handle】 /【Combine Curve】, or click ,the following dialog box appears.

The software automatically merge curves in the selected curves, when these curves merge tolerance is less than the setting of combine error.

4.13.8 Bitmap Handle

Click ， and select a bitmap, then click menu【Handle】->【Bitmap handle】, or click System Bar .



In the top right of the dialog box displays the information of the current image.
Be noted that，the horizontal resolution and vertical resolution is changing with drag scaling.

【Apply to view】: Current settings is only used for preview, without affecting to the original bitmap，press button【Cancel】，bitmap will returned to the state of original image. Therefore, only use for adjust effect. However, this approach requires more time and memory Space.
【Apply to source】: Current sttings is use for orginal bitmap directly，so even finally click button 【Cancel】，image will also unable to return to the original image. Therefore, it mainly used in multi-step operation，and the current operation of this step is necessary to do, such as general pictures must be transformed into grayscale. This can save the computing time of the follow-up operation.
【Save as】: Retain the results of the previous operation, In addition to using【Apply to view】can also be exported。On this basic, to facilitate subsequent processing.
【Gray scale】Generally, other image processing is based on the grayscale，so before handling, you can do a grayscale processing, then click button【Apply to source】。For the grayscale than the color image occupied smaller memory，for large image step by step handle, to a certain extent to avoid the lack of memory.
For color image, adjust contrast and brightness, have some auxiliary effect to following dither processing.

Adjust contrast:

Before processing

After processing

Invert:

Before processing

After processing

Sharp:

Before processing

After processing

There are three method for dither processing: Net graphic、Dot graphic、Black and white

Net graphic

Net graphic need adjust net size，better suited to material which is not high resolution，or the laser is relatively slow to respond.

To get the appropriate net size, you can adjust resolution and net frequency of the image.

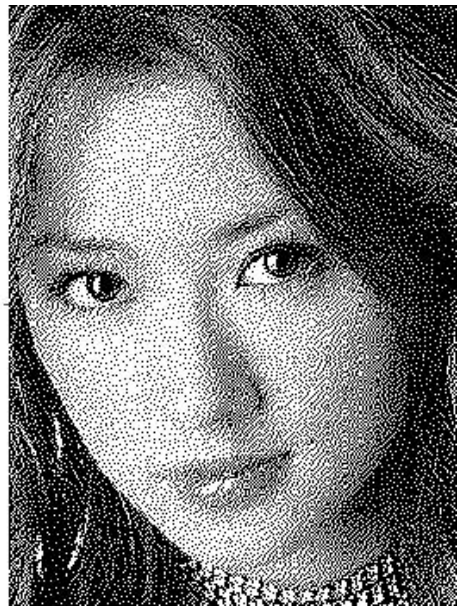
The higher resolution, the more delicate.

The higher net frequency,the smaller net size.The lower net frequency, the bigger net size.

Generally, resolution of image is 500 - 1000, and net frequency is 30-40lines.

Dot graphic

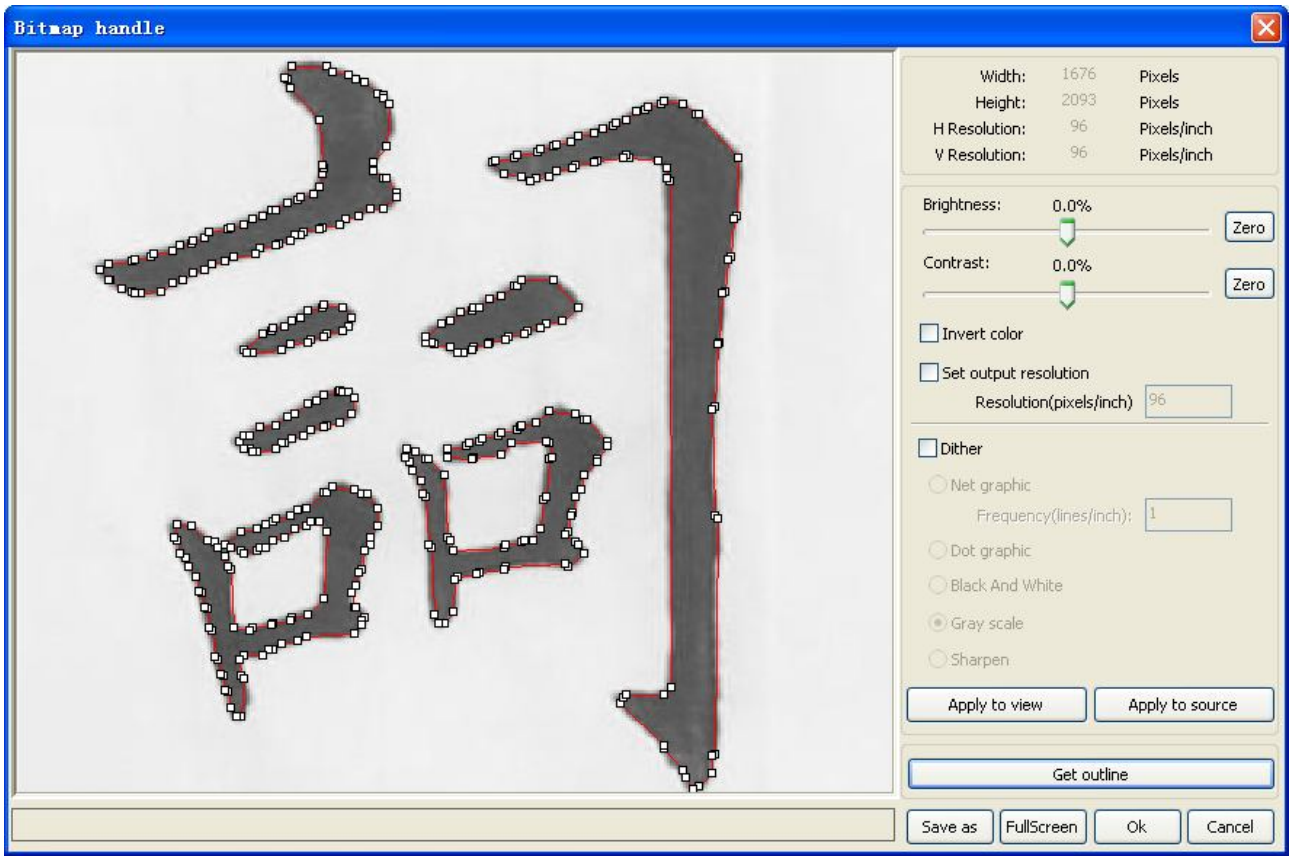
Dot graphic performance of good grayscale，better suited to material which is high resolution, and the laser responds fast.



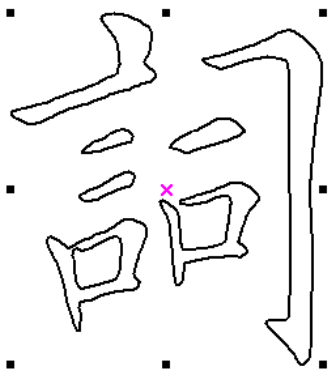
Black and white

In most cases, the effects of color image into black and white image is poor,， however, for some clear outline image, is very easy to use.

Get outline:

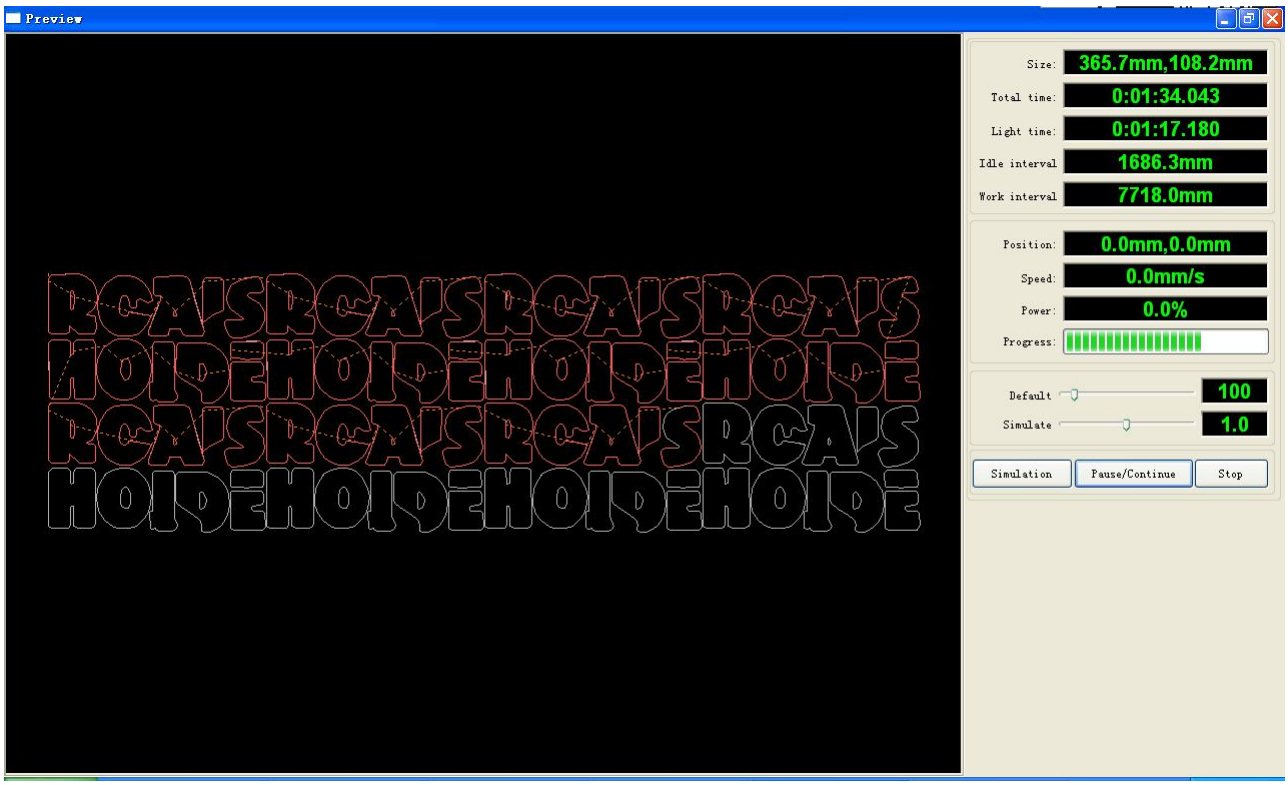


Click “Get outline” button to extract the contour graph. As following picture



4.13.9 Processing Preview

Click menu【Edit】->【Preview】, or click System Bar .

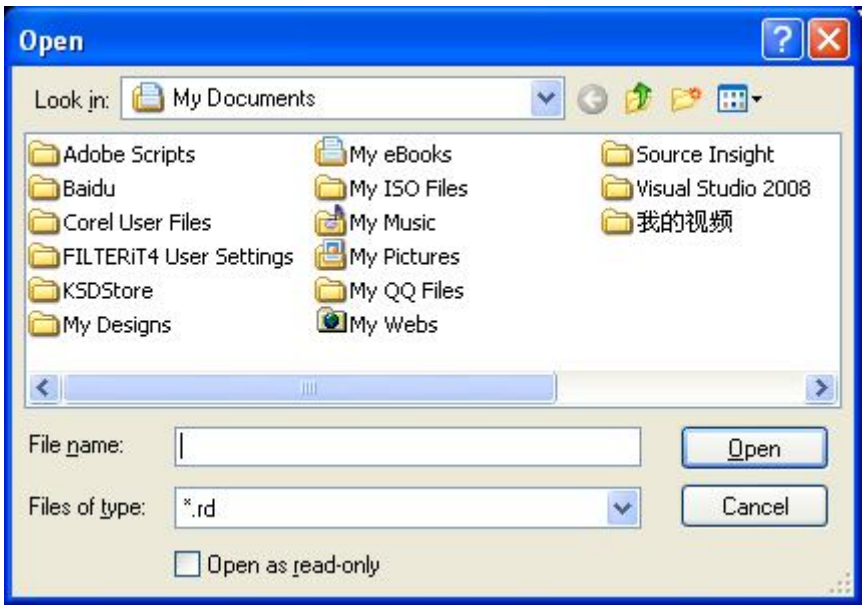


Software supports the preview of the documents to be processed, and you can get some basic information through the preview. For example, the path of the actual output of the processing, general processing time, processing the distance. The machining process can be simulated.

In addition to the current edited file preview, you can also preview the files have been saved as rd.

Preview rd file:

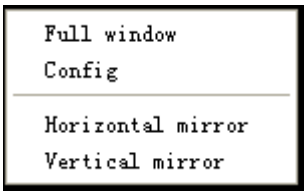
Double-click in the graphics display area. Choose the graphic you want to preview in the pop-up dialog box. And then open

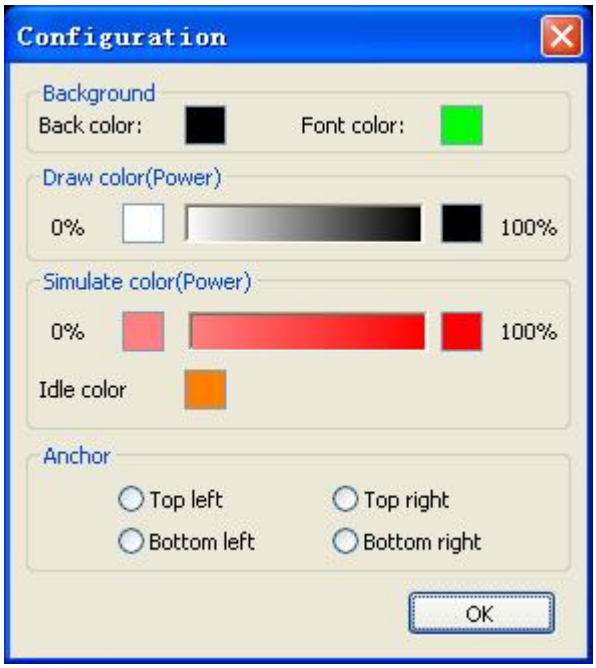


Software also supports to set the parameters of preview

Right-click Anywhere in the graphics display area, the configuration menu will appears.

Select “Config” , pop-up following dialog box

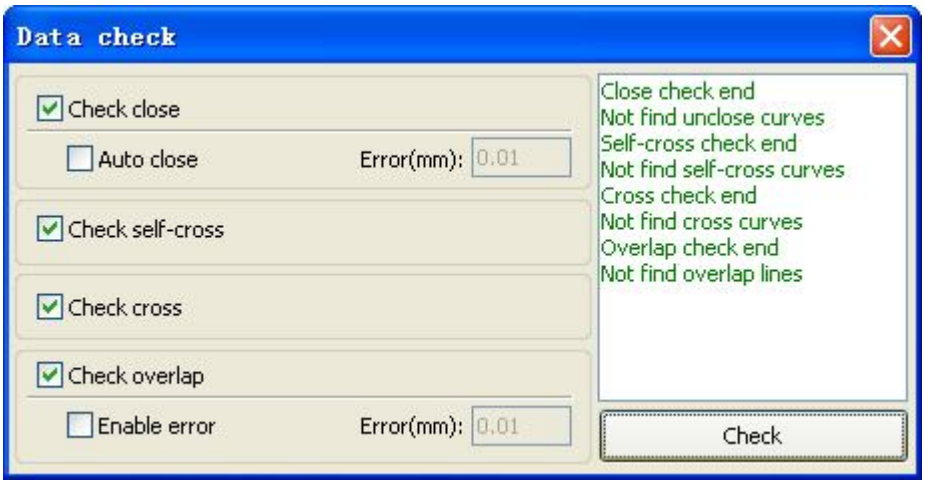




You can preview the color of graphics to match the actual output of energy. Users can easily view whether the layer energy is true.

4.13.10 Data Check

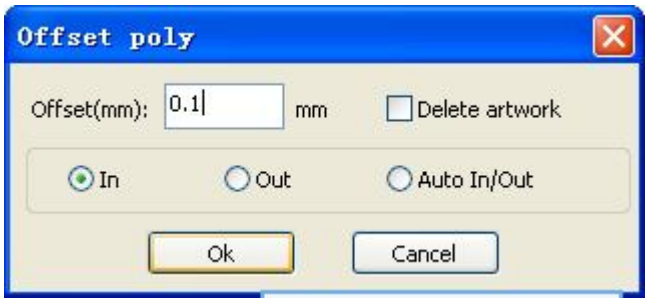
Selected to check after the graphics, click on the menu commands【Handle】/【data check 】, or click system toolbar .

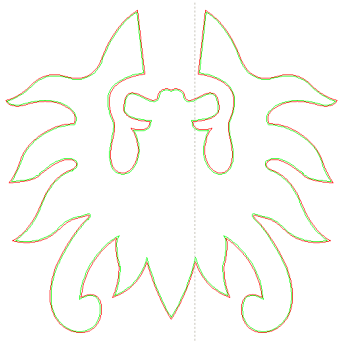


Data check, integration of the closed inspection, the inspection, the inspection, the intersection of the fellowship data overlap a check. The user can select a check, inspection to the problem after data, will be in the dialog box right tip have been found and, at the same time, the problem in selected state graphics. Check-> ruled out repeatedly error-> inspection process until all the data are conform to the requirements of the processing.

4.13.11 Generation Parallel Lines

Selected to create parallel lines after the data, click on the menu commands the 【Handle】 / 【Offset poly】, or click system toolbar .



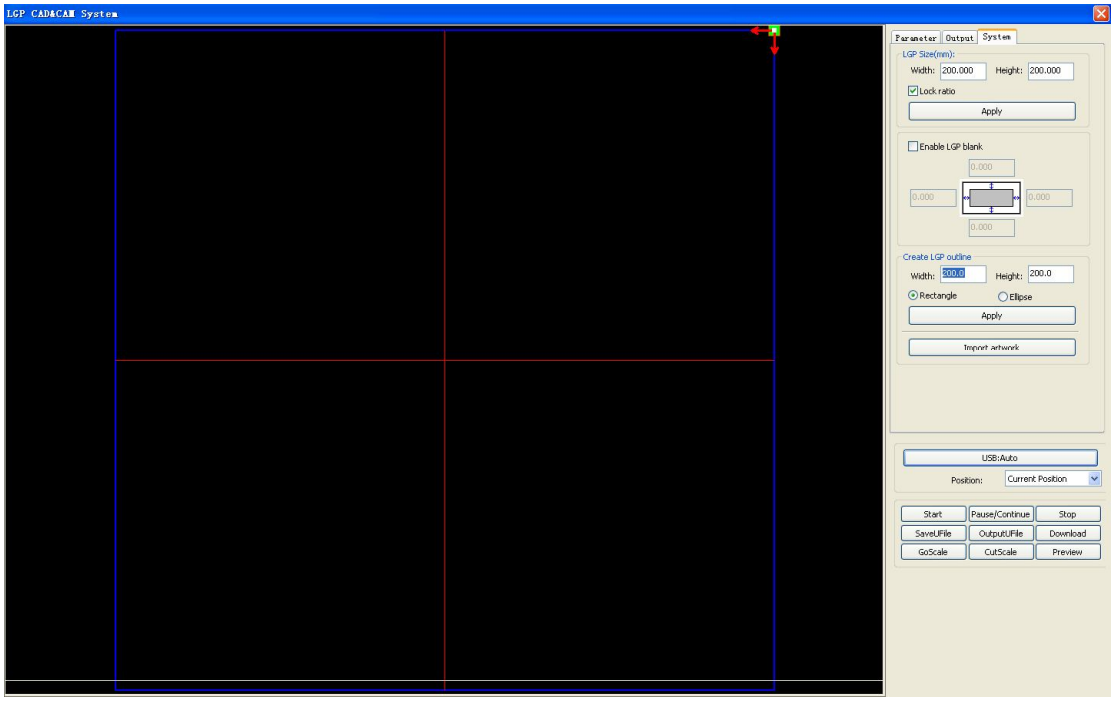


Red line in the figure for the original graphics, green line is inside shrink graphics.

4.13.12 LGP Design

Click the menu commands the 【edit】 /【LGP design 】 , or click drawing toolbar, already can start reflex block design tools, the tools are specific to block the sun processing, is an independent functions, such as the user is not involved in the sun block can be ignored this section processing content.

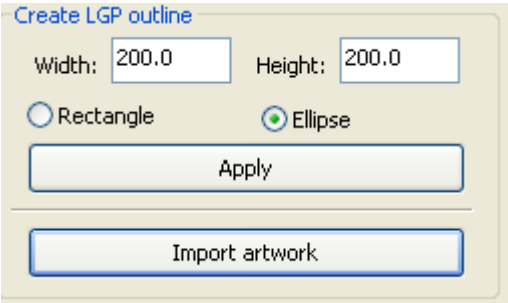
Play channel tabula rasa design tools, we first need to design a reflex guide the outline. Play channel tabula rasa design tools, we first need to design a reflex guide the outline



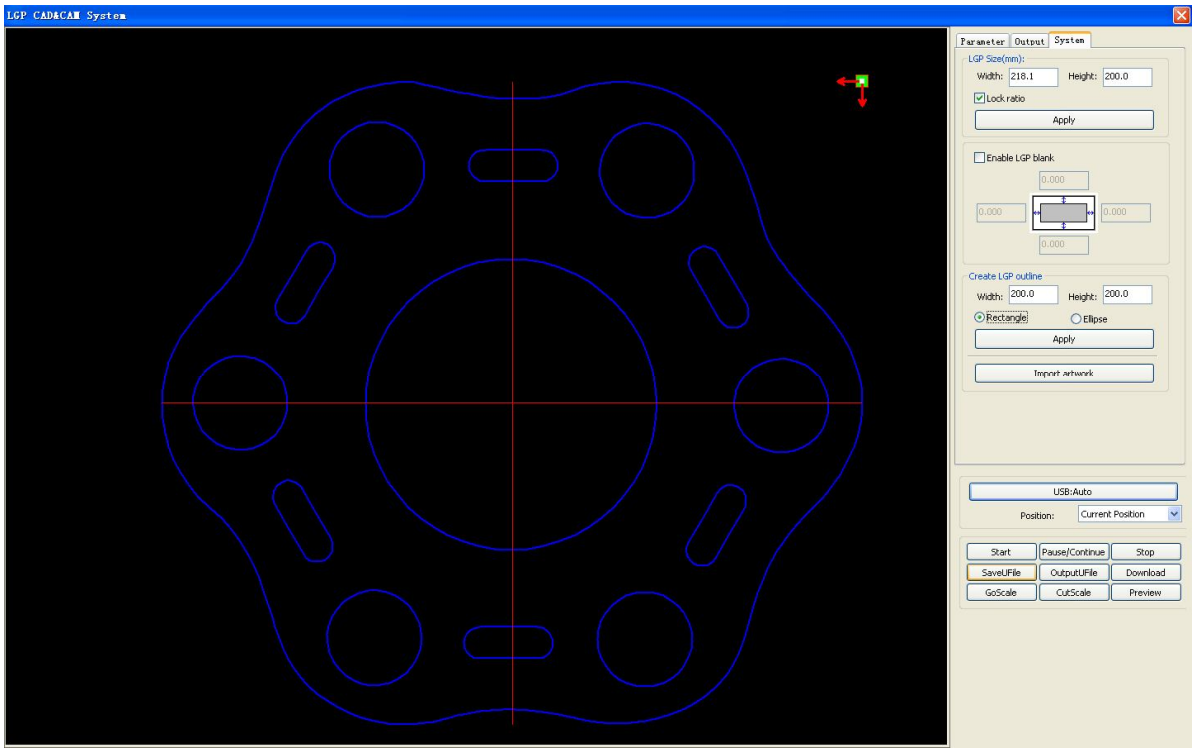
Play channel tabula rasa design tools, we first need to design a reflex guide the outline.

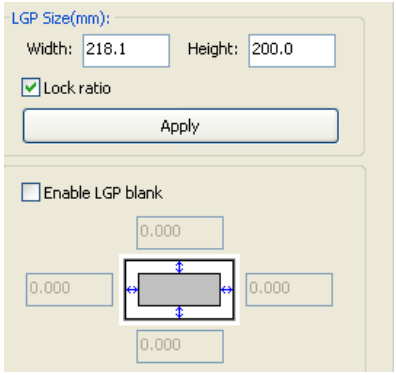
In the tool, the default created a 200 X200 rectangular guide tabula rasa outline. The user can in the tools of "system" page manually create a standard to the shape of the guide tabula rasa outline.

Create standard setting the outline can use rectangular or oval.



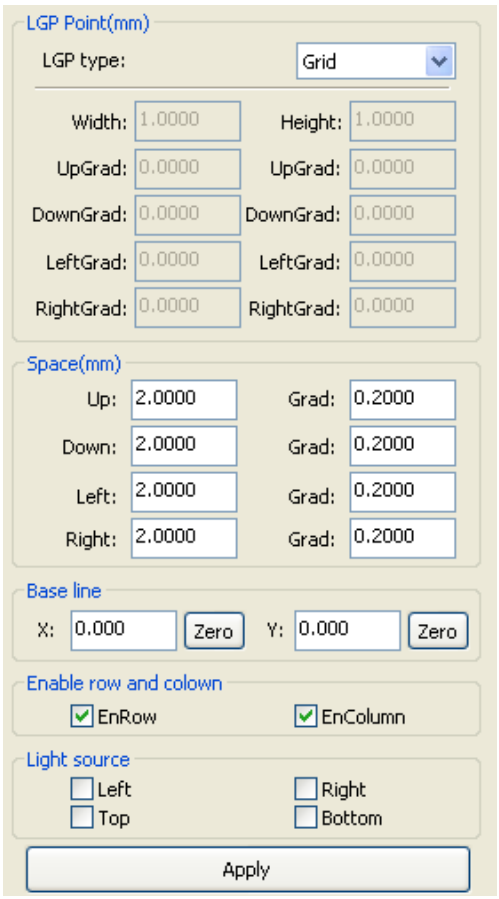
The user can also import a has good graphic design, as the outline of the sun. Click on the "introduction to guide tabula rasa contour" button, can choose to have the outline of the document as the sun. Need to point out that outline file must be closed graphics, otherwise, the system will automatically deleted.





If the outline of import size requirements, users can also change size outline, and can set up if stay white edge.

Outline graphics ready, they can start on the tabula rasa increase network.



Network is divided into four ways: straight line, elliptical, rectangle and the grid.

Network is divided into four ways: straight line, elliptical, rectangle and the grid.

Baseline related with light source, the user can adjust the baseline position according to time light source. In the figure above red graticule marker is the baseline, users can move the mouse to baseline, press the mouse, and then drag the baseline to want to position.

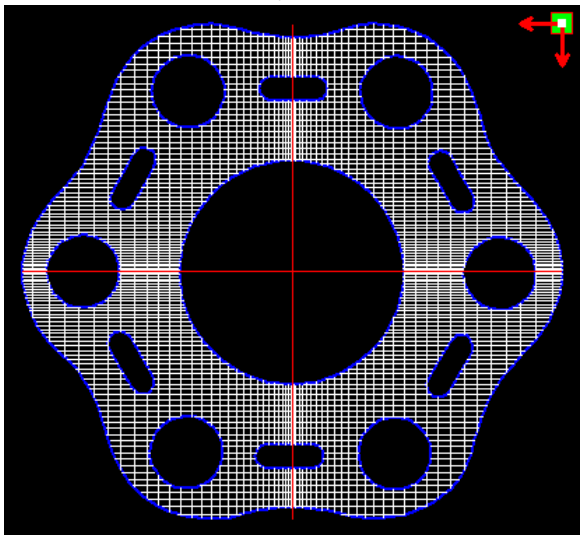
The entire guide baseline reflex is divided into four regions, level above baseline definition for uplink and downlink below defined as; Vertical baseline definition for the left column on the left, the right to define right column.

Set respectively size and spacing network respectively in up, down, left column, the right column initial value and the gradient of the change, can form users want to conducting tabula rasa effect.

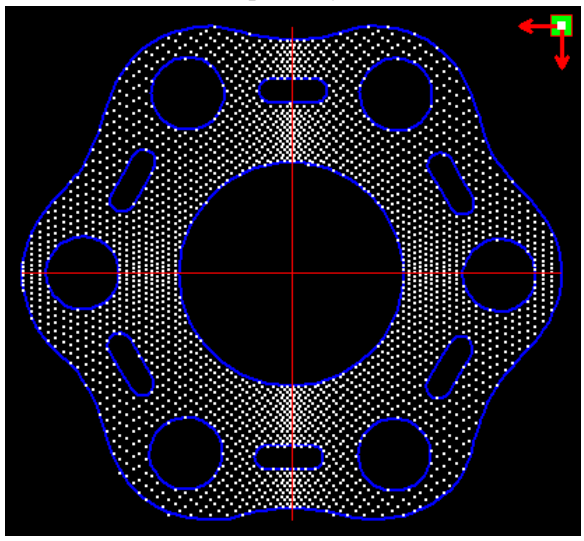
For grid way, must set exercise can/column that can, can appear the grid.

For the convenience of application, the system to provide the light setup, if the light source is a standard, can choose the light source, then set the network parameters can be, do not need to adjust the baseline. At this time, baseline shows hides also.

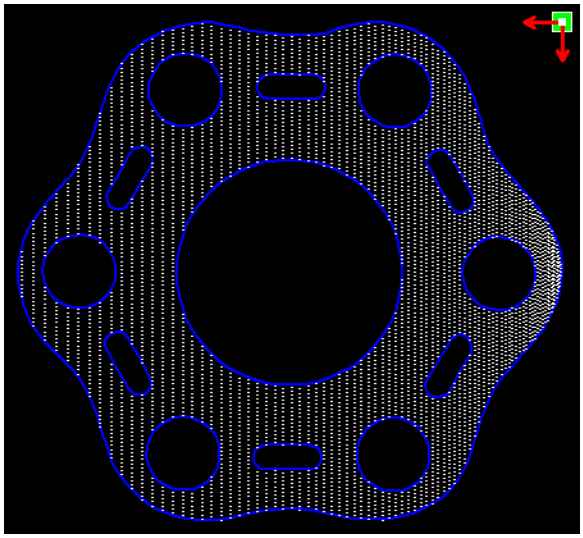
Grid way



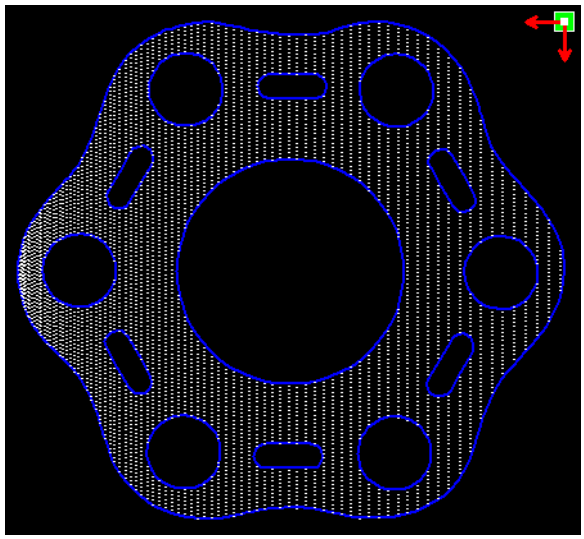
Elliptic way



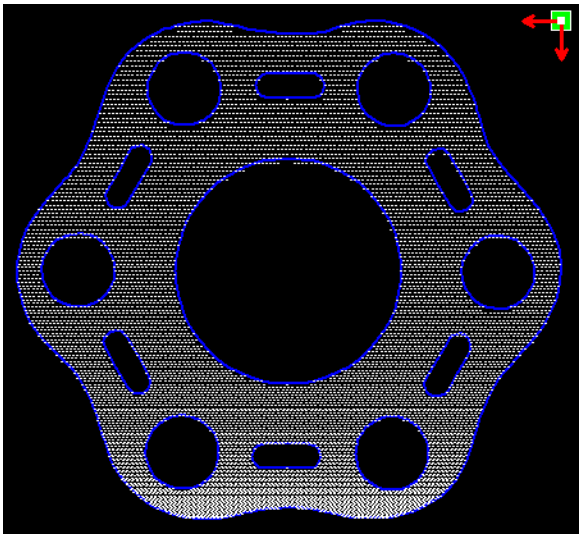
Left light source



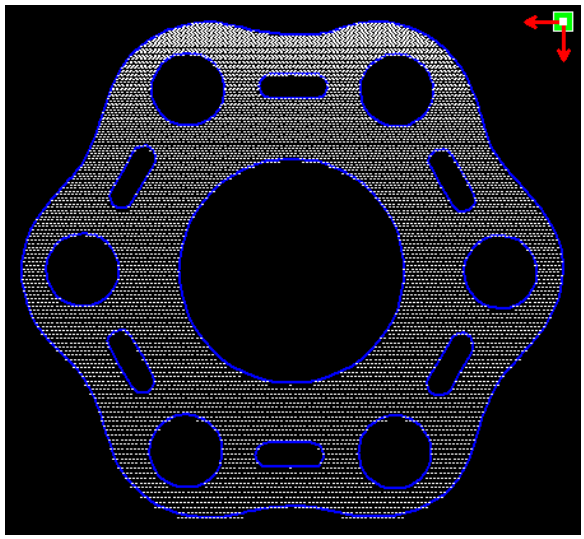
Right light source



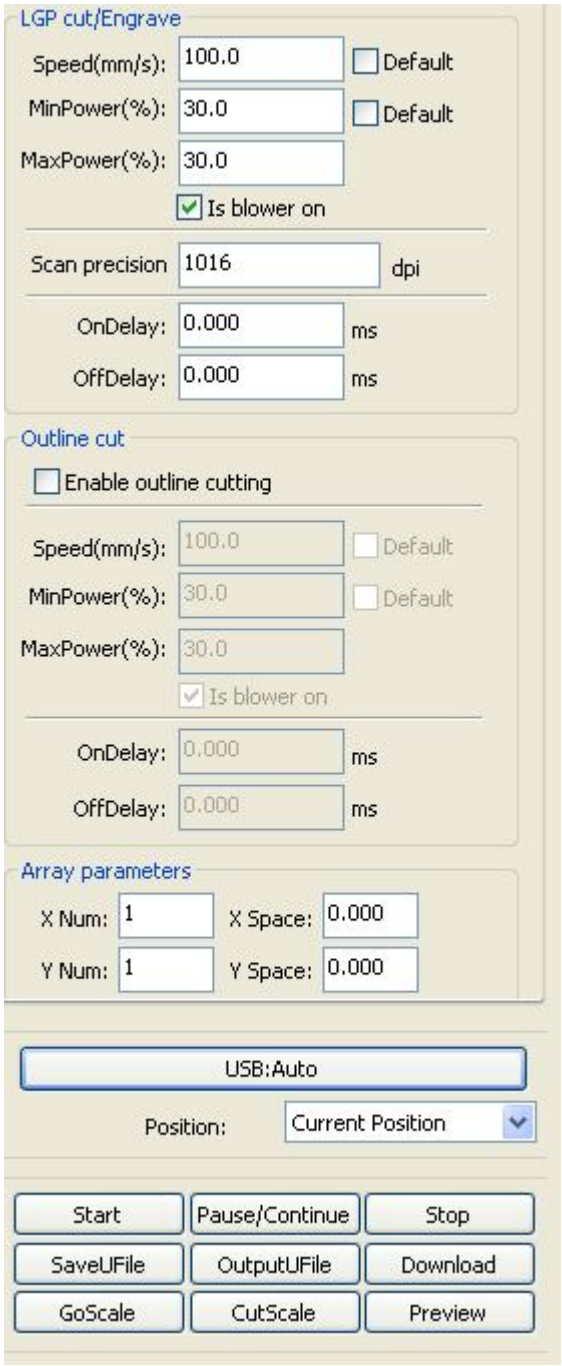
Top Light source



Bottom light source



Line, elliptical, rectangular way is the network scanning mode of output.



Scanning mode, the minimum energy, maximum energy general is same, and dedication of the delay is 0. By adjusting the scanning system precision, to adjust the scanning of the density, the more accurately the scanning scan line secret, scanning the lower accuracy the scan lines sparse.

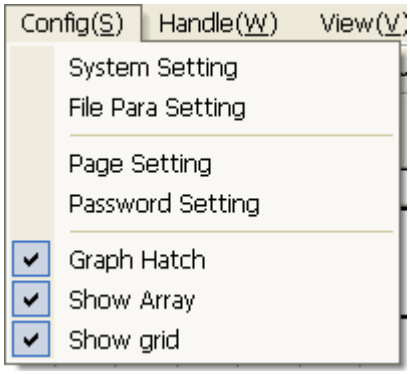
The grid processing methods is cutting, and scanning not precision, and can be adjusted according to the actual effect, the maximum and minimum energy energy light switch delay, generally speaking, the least energy slightly lower than the maximum energy.

If need to cut the reflex the outline, make can contour cutting. About cutting parameters and common cutting Settings identical, in hereby here.

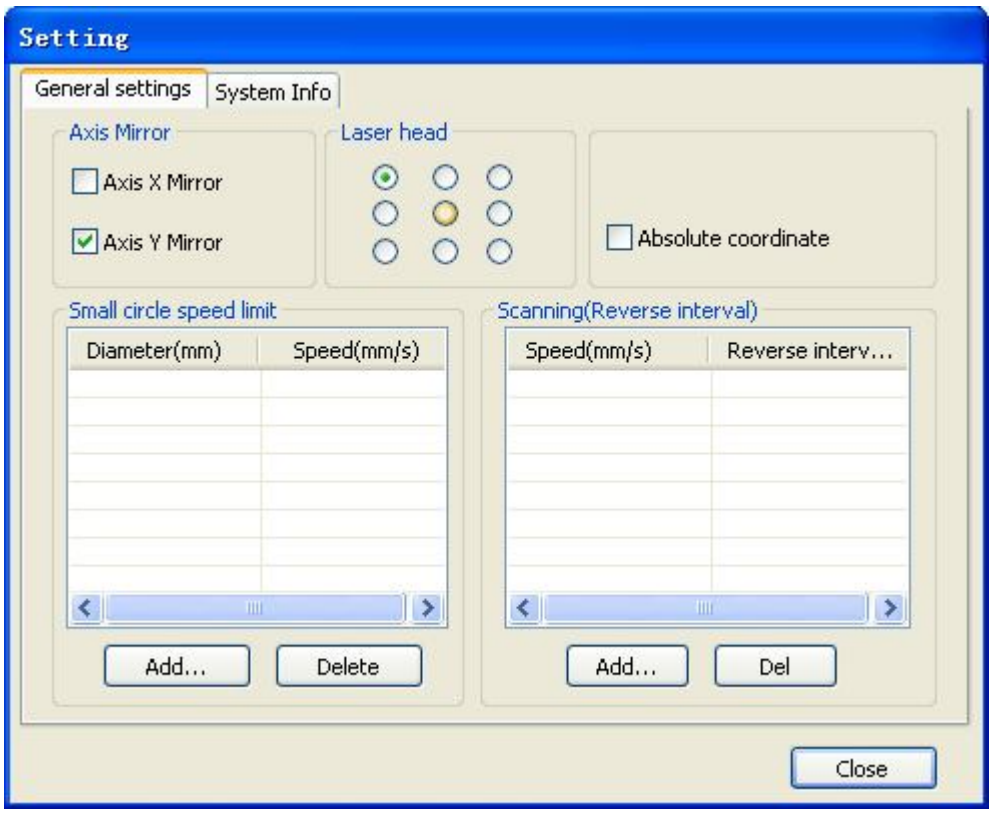
If need to press array in the way processing more panels, can be set to array parameters; Array direction along the machine is always the origin in the opposite direction.

Chapter 5 System Settings

Before output graphics，required to determine whether the system settings are correct. Click menu 【Config】->【System Setting】



5.1General Settings



Axis Mirror

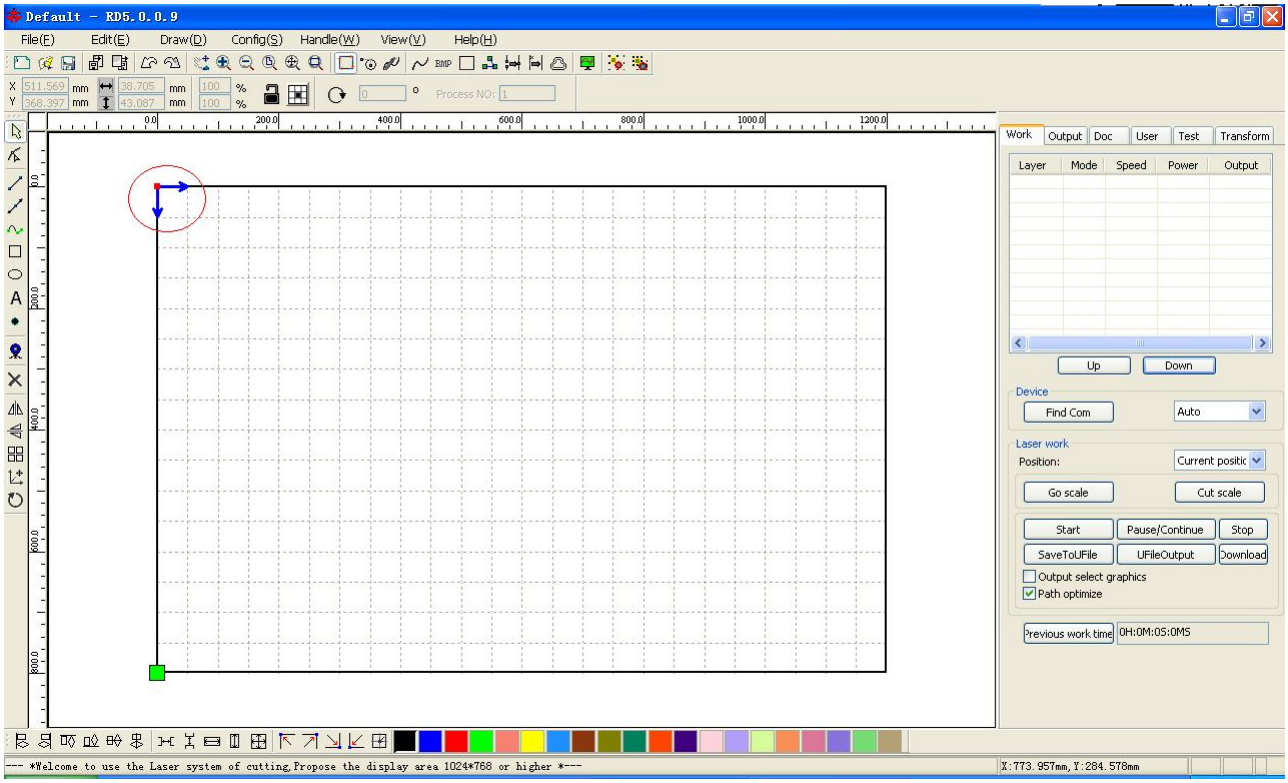
Generally, Axis direction of mirror is based on the actual location of the limit or home of machine.

The default coordinate system if Descartes coordinate system, and zero in the bottom left.

If the zero point of the machine is top left, then X-Axis do not need to mirror, but Y-Axis need to mirror.

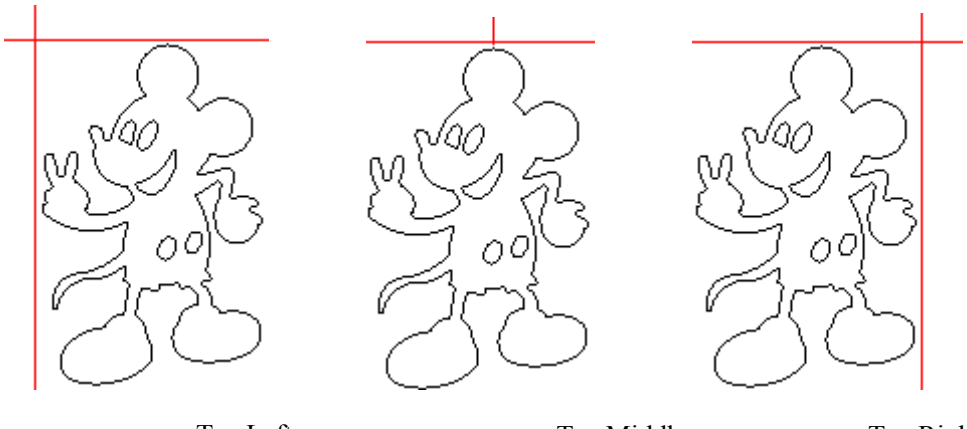
If the zero point of the machine is top right, then both X-Axis and Y-Axis are all need to mirror.

In addition, this function can also use to other application for mirror.

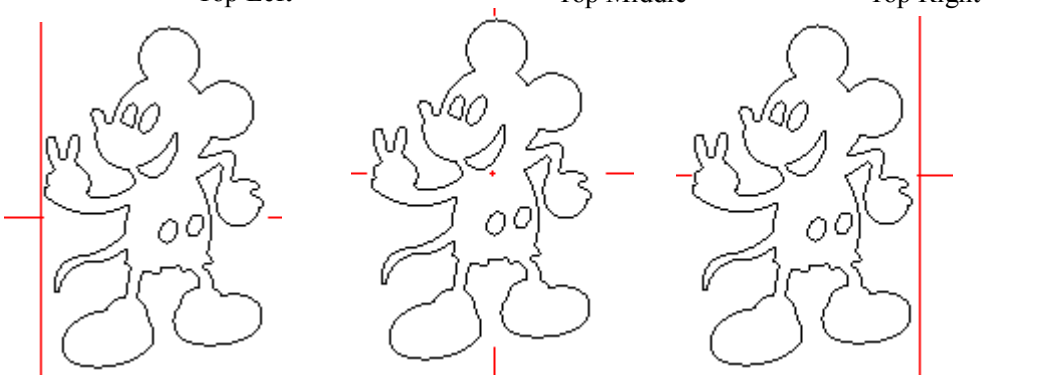


Laser head

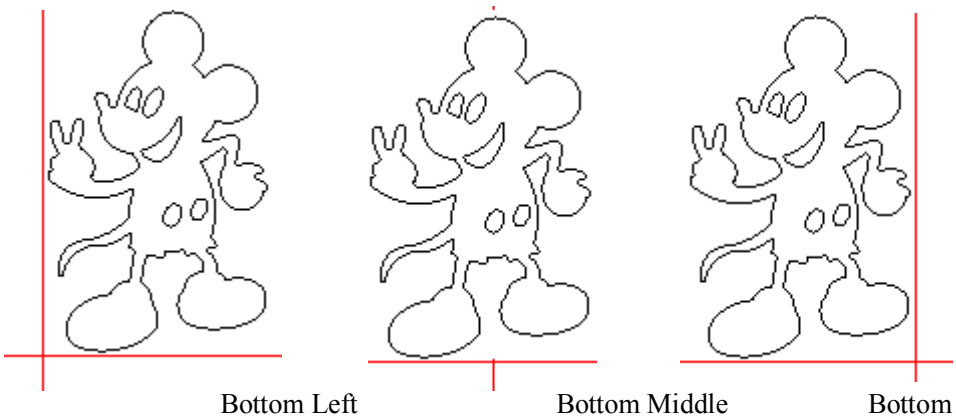
Position of Laser head means the location laser head relative to the graphic.



Top Left Top Middle Top Right

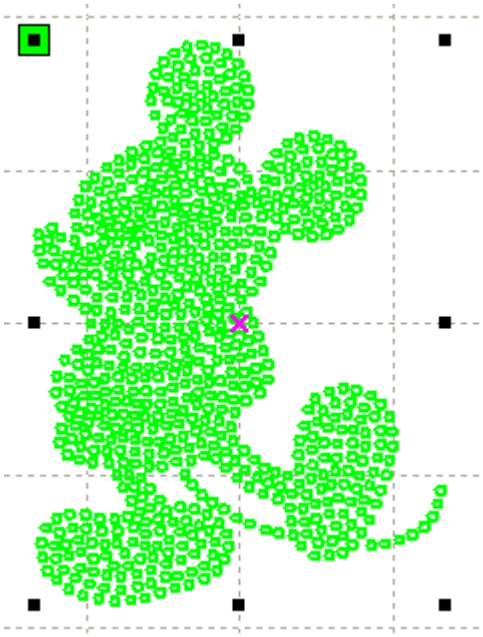


Middle Left Center Middle Right



Bottom Left　　Bottom Middle　　Bottom Right

when you intuitive view, just look at the zone where the green point appears.



Absolute Coordinate

You can directly check this option when you want the graphics location in the graphics display area correspond to the actual work location of processing. Then the graph position will no longer relate with the actual output position of the laser head and orientation point, but always regard mechanical origin as the anchor point.

Small Circle Speed Limit

On processing work，the software automatically determine whether the current round need to limit speed ,then according to the diameter size of the circle to determine the speed. If parameter configuration appropriate ,will greatly enhance the quality of small round. Click button【Add】,【Delete】, 【Modify】 to configuration.

Small circle is less than speed of the rules limiting the list of small round circle of minimum radius, minimum radius circle at the speed of the output of the corresponding.

If the speed greater than maximum speed limit list the speed round, the speed only associated with the speed of the layer.

If the speed is in the list, set the output speed by list.

If the request received by limiting layer parameters faster than the speed set in the layer, press

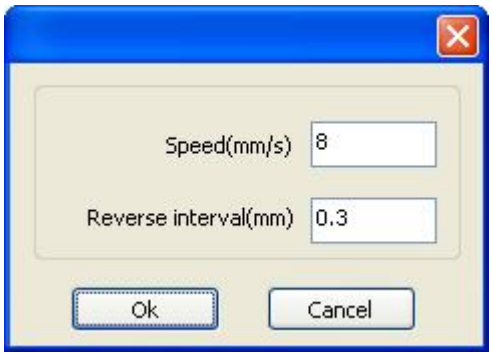
the speed of the output layer.

Scan backlash

Laser scanning graphic way, because the relationship between the machine belt tension may cause the edge of the scanned graphics uneven. Therefore, increasing backlash to fix. It has the specific backlash for the certain speed. General, the greater the speed, the greater the backlash.

① **Add backlash**

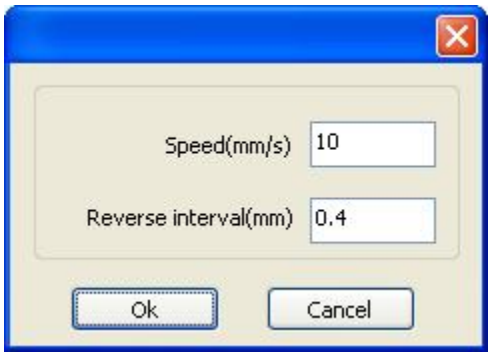
Click the Add button, the screen will pop up as shown in Figure



Set speed and backlash, click OK, the value to be inserted into the list of backlash.

② **Modify backlash**

Double-click the left mouse button scanning (reverse gap) need to modify the reverse block entry clearance, then the pop-up screen shown in Figure.

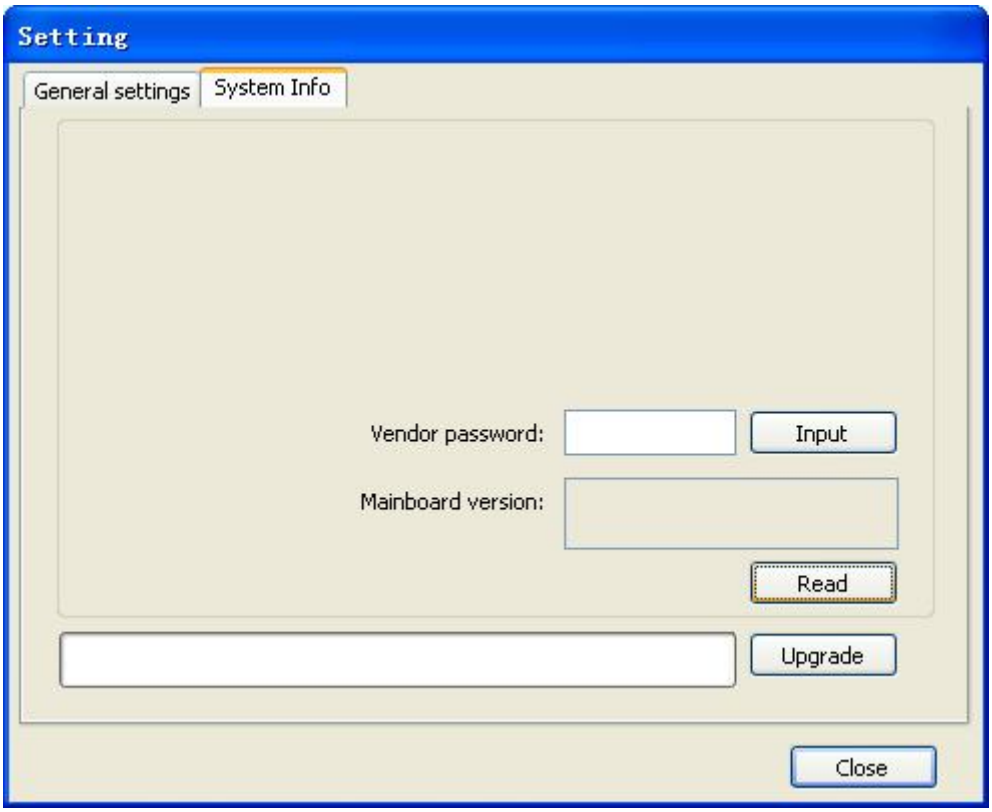


In the interface can modify the current speed of the corresponding backlash.

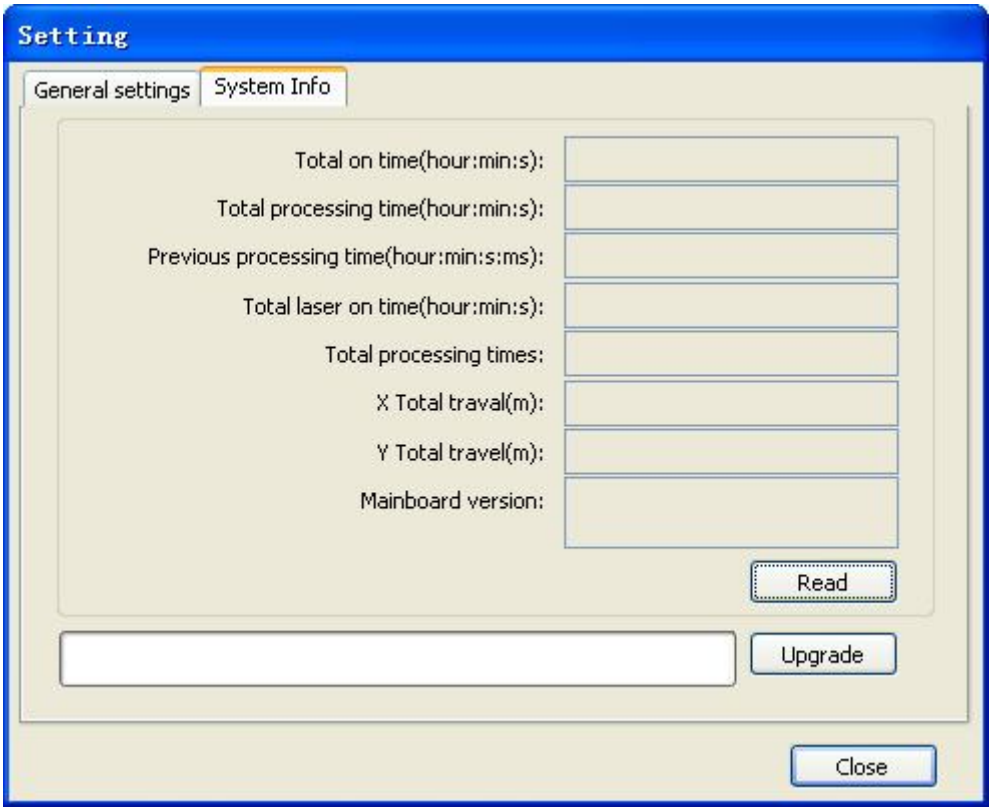
③ **Remove backlash**

Right-click scanning (reverse gap) block in the backlash to delete the item, then click the 【Delete】button.

5.2 System Info



Information on the operation of the motherboard manufacturers need to enter password to view parameters.

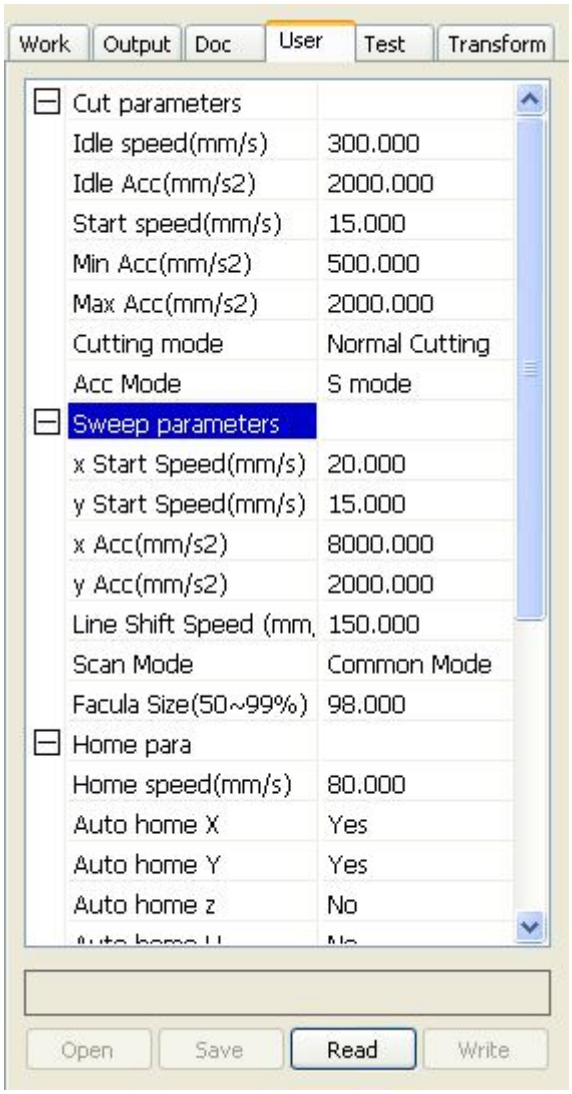


Total on time: The total time of motherboard working
Total processing time: The total time of processing ,including the time of jump moving.
Previous processing time: The time of the last processing
Total laser on time: The time of the laser processing
Total processing times: The number of completed processing, not include the processing forcing to end.
X total travel: The total travel of motor X.
Y total travel: The total travel of motor Y.
Motherboard version: The version of the current controller.

The function of upgrades:

If the board has additional features, the manufacturers will provide the update file (*. bin format), the user can load the upgrade file to upgrade the motherboard. After the upgrade, you need to click on the control panel "Reset" button reset the motherboard before normal use.

5.3 User Parameters



Reading the board parameters must before operating the user parameters.

5.3.1 Cut Parameters

Cut parameters	
Idle speed(mm/s)	300.000
Idle Acc(mm/s2)	2000.000
Start speed(mm/s)	15.000
Min Acc(mm/s2)	500.000
Max Acc(mm/s2)	2000.000
Cutting mode	Normal Cutting
Acc Mode	S mode

Idle speed: this parameter decides the max. speed of all lines not emitting beams during the operation of the machine. This parameter should not be lower than the lower of the jump-off speed of the X-axis and that of the Y-axis and not exceed the higher of the max. speed of the X-axis and that of the Y-axis, if the setting is illegal, the controller will automatically set this parameter within the range above; a comparatively high idling speed can shorten the operation time of the entire figure while excessively high idling speed may cause dithering of the tracks, therefore, you should take all relevant factors into consideration when setting.

Idle Acc: Corresponds to the acceleration of the speed of air travel time, air and air-way-way speed of acceleration to match, if you set too slow the actual speed may not reach the air-way set value, if set too fast, they may not withstand the mechanical structure, resulting jitter . Slightly higher than the general acceleration of air-way cut acceleration.

Cutting Acc: Corresponding to the acceleration of the speed of cutting (cutting speed is the speed of the layer parameters of the layers).

Turning speed: Turning the corresponding deceleration in the cutting process, the minimum speed of the drop, when processing a lot of teeth when the graphics may be appropriate to reduce the turning speed.

Turning Acc: Should match with the turning velocity.

Cutting mode: Split precision cutting, fast cutting, ultra-fast cutting, the user can choose according to the actual applications. Such as the emphasis on accuracy, select the precision cutting, such as emphasizing speed, select the fast cutting.

Acce. mode: this parameter decides the acceleration and deceleration mode (S mode or T mode) of the motor during operation, the motor accelerates and decelerates slowly and smoothly in the S mode and fast and relatively unsmooth in the T mode; the default mode is the S mode.

5.3.2 Sweep Parameters

Sweep parameters	
x Start Speed(mm/s)	20.000
y Start Speed(mm/s)	15.000
x Acc(mm/s2)	8000.000
y Acc(mm/s2)	2000.000
Line Shift Speed (mm,	150.000
Scan Mode	Common Mode
Facula Size(50~99%)	98.000

x Start Speed, y Start Speed: Off scanning speed in the use of stepper motor drag, do not

began to accelerate from 0, but can start work directly from a speed to shorten the overall processing time, but the speed is not too high, and because the X, Y axial load is different from the rate, general the initial speed of X-axis slightly higher than the initial speed of Y-axis

x Acc, y Acc: With the scanning speed (the speed of layers in the layer parameters) to match, if set too small, the scan speed to a longer distance, the scanning efficiency. The machine can be set according to the actual structure, load conditions vary. Since X, Y axis load, generally much higher than the X-axis Y-axis accelerometer.

Line shift speed of scanning: this parameter is specially used to control the max. speed of the scanning to shift vertically from one line to the next line below it. If during the scanning, the line space is too large or the block space is too large when scanning block figures while precise positioning for each line or block is required, you can set the line shirt speed of scanning to a comparatively low value. This parameter cannot be less than the jump-off speed of the corresponding axis during the line shift and cannot be higher than the max. speed of the corresponding axis during the line shift, if the setting is illegal, the controller will automatically set this parameter within the range above.

Scan mode: There are two modes for your selection: the general mode and the special mode, in the general mode, there's no any treatment during the scan, in the special mode, light spots will be treated. If the special mode is activated, the power of the laser should be increased and correspondingly, the light spot percentage will be lower and the laser power attenuation will be higher, to achieve the same depth of scanning, the laser power should be higher. The purpose to select the special mode is to make the laser to emit beams at high power and in short period, during deep scanning, the effect of flat bottom can be achieved, however, if the light spots are improperly adjusted, this effect may not be achieved and the working mode of high power and short period may influence the service life of the laser. The default mode is the general mode.

Facula Size: When scanning the general pattern of selection, the argument is invalid, when you select a special mode, the onset of the parameters. Control the parameters of control in 50% to 99%, respectively.

5.3.3 Home Parameters

Home para	
Home speed(mm/s)	80.000
Auto home X	Yes
Auto home Y	Yes
Auto home z	No
Auto home U	No

Home speed: This parameter determines the machine is turned back to the origin when the speed of a larger format if the machine can be set to reset the speed is too large, but not too much.

X, Y, Z, U Auto home: The axis can be set whether should reset at boot time.

5.3.4 Go Scale Parameters

Go Scale para	
Go scale mode	Close laser
Go scale blank(mm)	0.000

Go scale mode: Points of light to go off the border, the opening cut borders, corners three modes.

Go scale blank: Walking frame can be based on the actual image size up and down again about the direction of some of the white left side of the border in order to ensure complete contains the actual graphics.

This setting is on the control panel to go with the border-related functions, while walking on the border with the independent software.

5.3.5 Other Parameters

Other parameters	
Array processing	Bi-dir Array
Return position	Absolute Origin
Delay before feed(s)	0.000
Dealy after feed(ms)	0.000
Focus depth(mm)	0.000
Backlash X(mm)	0.000
Backlash Y(mm)	0.000

Array mode: you can choose the swing mode and the one-way mode. The Swing mode: cutting the array back and forth in order; the One-way mode: always cutting the array from one direction to another. If One-way mode is selected, all array units have the same movement modes and the same liquidity of movement, however, this mode will take more time than the swing mode. The default mode is the Swing mode.

Return position: You can select the locating point and the machine origin. This parameter decides the position, the locating point or the machine origin, where the laser head stops upon completion of each operation.

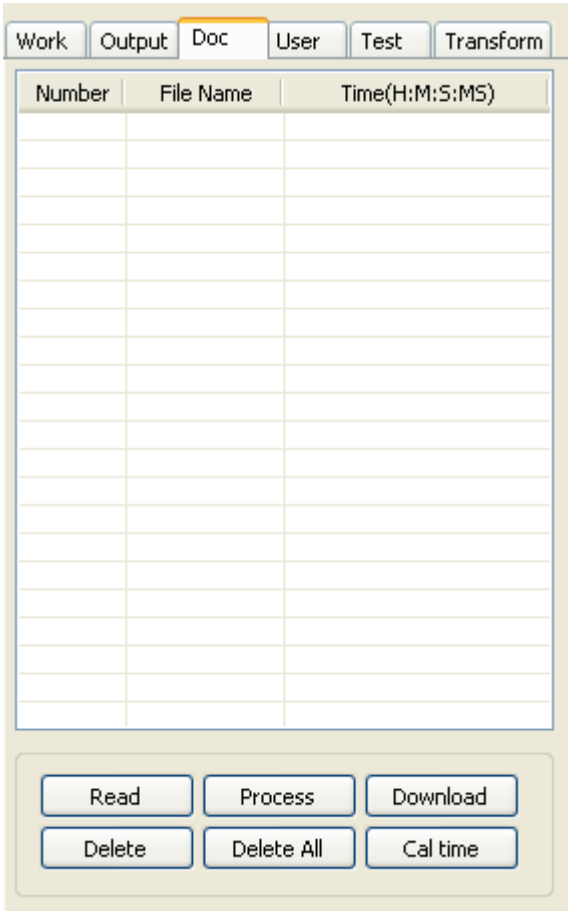
Delay before feed: Using the feeding device, the delay before a single feed, users can arrange the time and the like, such as picking process.

Delay after feed: Refers to the material sent to the feed device in place, the need for stability after a period of time for processing.

Focus depth: Auto focus operation to find the corresponding panel.

Backlash X, Y: Used to compensate the backlash caused by the machine drive problems.

5.4 Document Management



Read

Click button Read，the software will communications with the controller，read the list of files on the controller.

After read controller successful, file information will be displayed in the document list.

Download

Click button Download，will pop up the file dialog , select *.rd downloaded file, then the file will be downloaded to the controller.

If the download is successful, the document list will update.

Process

Select the file to be processed from the document list , and click button Process

The controller will start the specified document。

Delete

Select the file you want to delete from the document list，and click button Delete

The controller will delete the specified document.

If the deletion is successful, the document list will be updated.

Delete All

Automatically remove all file in the controller, and update the document list.

Cal time

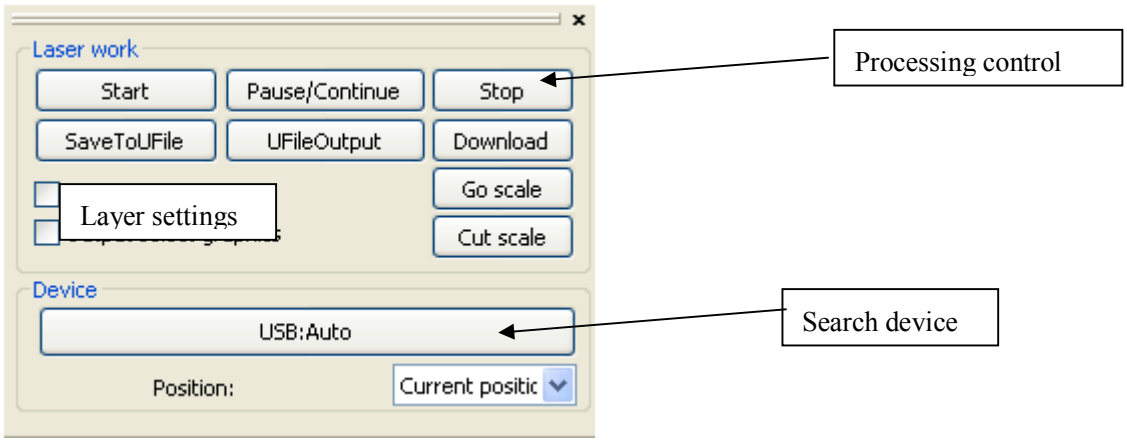
Motherboard supports processing files towards hours worked. Select the file to calculate the work hours worked and click the button. Calculation to be completed, the control panel will be prompted to complete the calculation. And then point to read button shown in the list, calculated from the working hours.

In addition, when the document processing operation performed, the hours information will also be covered by the actual processing work.

uploading

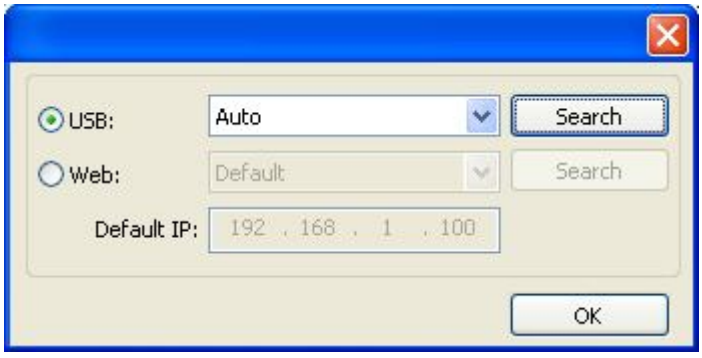
On the main board of the selected from read offline files, and saved to the computer.

Chapter 6 Processing Output



6.1 Search Device

Link device in two different ways: USB and network.But through some equipment port button on the popup dialog box, set connection mode and choose connection port.



If the computer only connected one device，you can set to Auto。The software will automatically search the device.

If the computer connected many devices, then first of all you need to click【Find com】.

After search, the connected devices will all add to the drop-down list.
What you need to do is select the specified device.
Network: if the computer is connected only a laser equipment, which can be directly in the default IP address to enter in connected device IP.
When the computer connection has many sets of laser equipment, and USB operation is similar.
Search at present already connected device, and choose from the drop-down list corresponding IP address machine.

6.2 Layer Processing

First, in the menu 【Handle】->【Path optimize】 check “according to layer order”, then click “OK” to exit.

Layer reorder: Click button Up, Down can change the order of layers, or direct the mouse to drag the layer to the specified location.

Here, you must check the “Path optimize” option.

6.3 Position

Setting the laser head back location after processing completed.(Current position、Original anchor、Machine Zero.

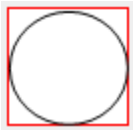
Current Position : Laser head back to the position before processing.

Original anchor : Laser head back to the last anchor ,the anchor may set at panel.

Machine zero : Laser head back to the zero of the machine.

6.4 Go Scale、Cut Scale

For Example Go Scale, As the following figure shown, the actual graphic is round, and the red rectangle outside the circle is the smallest rectangle, click button Go Scale, laser head will run once along the rectangular path.



For Example Cut Scale, As the following figure shown, the actual graphic is round, and the red rectangle outside the circle is the smallest rectangle, click button Cut Scale, laser head will be cut along the rectangle.

6.5 Start、Pause、Stop、Save To UFile、UFile Output、Download

Start：Output the current graphic to the machine for processing.
Pause\Continue：Click Pause，will stop the processing work, click the button again to Continue
Stop：Stop the current processing work
Save To UFile：

Save current file as RD format，using for offline processing（Can be copied to other memory board for full offline operation）。

UFileOutput：
Output the offline file (RD format)
After save offline file, click UfileOutput to select rd file to processing.
Download：
Download the file to the memory of the controller , then user can start the file through the machine panel.

6.6 Output Select Graphics

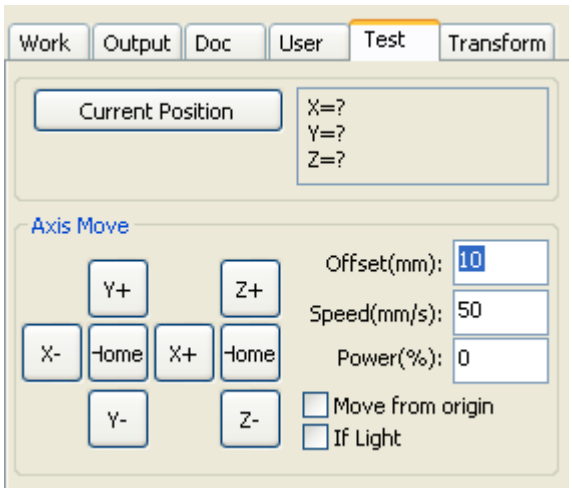
After check Output select graphics， then only output the selected part, rather than not output the part not selected.

6.7 Path Optimize

After check Path Optimize， then automatically perform the path optimize before the output.

If has done the Path optimize or not need optimize, then not check Path Optimize can reduce waiting time.

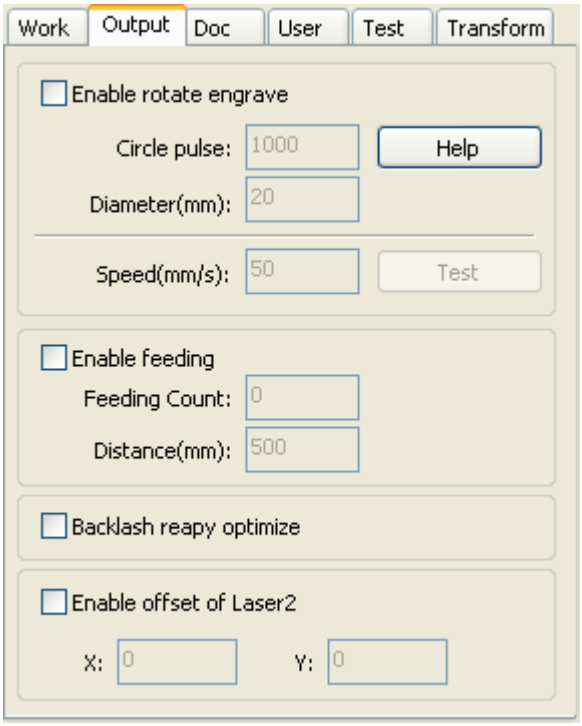
6.8 Test



Axis control, can only control one axis each time. You can set the information for axis move, including move length、speed、laser on-off and laser power.
If you check “Move from origin”, then the offset you set means the offset to machine zero.
If you not check move from origin, then the offset means the offset to the current position.
The X-axis, for example, assuming the current position is 100mm, such as the step distance is set to 10mm, then the exercise once, the new location will be 110mm, such as the check moves from the origin, movement time, the new location will be 10mm, and repeated Movement, location will no longer change.

Note: According to the provisions of the controller, the absolute position is no negative in the whole breadth. If you check the Move From Origin, and set the offset value negative, then the machine will hit limiter.

6.9 Output Settings



6.9.1 Rotating Sculpture

【Enable rotate engrave】: After enable engraving，the actual precision of Y-axis will be based on diameter and step per rotate to auto match the setting of pulse precision of Y-axis. In addition, the work area in the main interface will also change.

【Diameter】: The diameter size of the parts.

【Step per rotate】: The number of pulse corresponds to the workpiece rotate one week.

【 speed 】 : test the speed of work.

The function is to facilitate the users to replace parts, and different size of the workpiece when the workpiece is not very different before use. When the relatively large difference in size of the workpiece, it is recommended to use directly modify the motor step approach to implementation.

Rotary engraving is only when using the rotation axis to replace the Y-axis use.

6.9.2 Feed Setting

To use the feed, must first enable the feed.

After set feeding parameters，the shaft will be feeding a feeding length, and repeat the process , until the times of processing reach to number of feeding.

If the machine is not equipped with feeding devices, in general, enable the feed ban.

6.9.3 Optimization of Backlash Compensation

When the machine there is space (such as dislocation of the seal cutting graphics), can be checked.

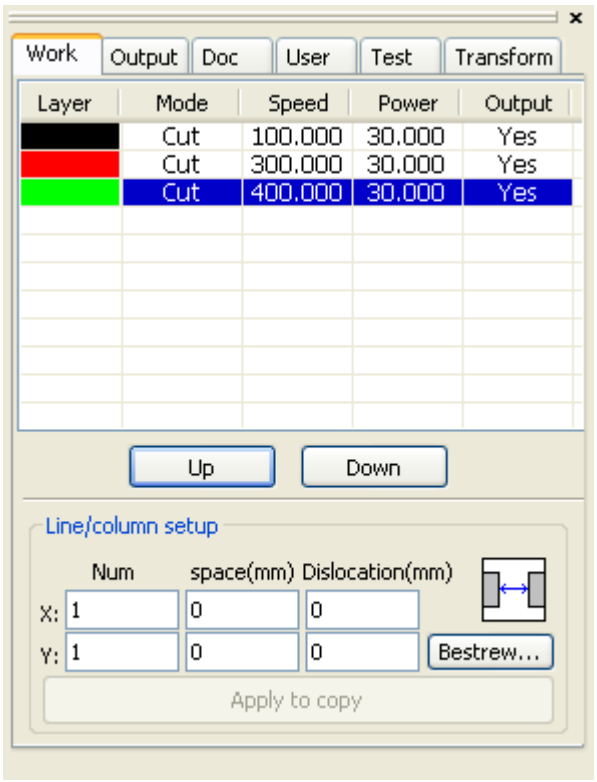
6.9.4 Optical 2 Migration

In need laser collaborative work, complete the same graphics processing occasions, usually, to use the optical 1 to define the graphics location, then if the optical 2 can accurately with the optical 1, will need to specify the optical 2 relative to the optical 1 offset.

This generally used in two power different laser tubes of machine, because two of laser tube power different, cause different functions.

If some machines equipped with two different power of laser tube, a responsible for cutting, a responsible for sculpture.

6.10 Layer Settings



6.10.1 Ranks Setting

For convenient to set in machining graphics processing on the array.

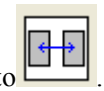
X numbers and Y numbers, which was the array of columns and rows.

X intervals and Y interval, respectively is array of the column spacing and line spacing.

Layer: Software use layer to distinguish processing graphics parameters of different layers.

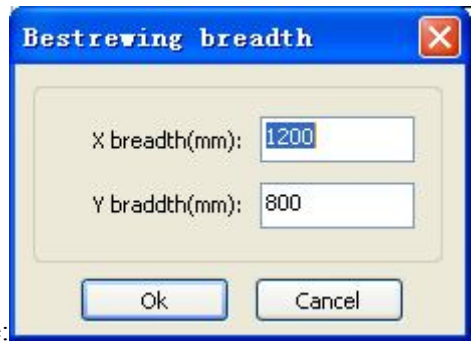
.The X interval is said and Y representing between interval graphics margins.

If hope X interval and Y interval which between is representative of array center of the graphics

spacing can switch to  .

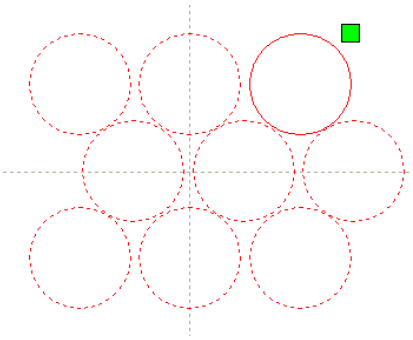
Adjust the X, Y interval between enable graphic layout more closely, can click drawing area, make graphics in the selected state, and then through the keyboard of the up and down or so key to adjust, and rolling the mouse can be displayed scaling, make the spacing of the adjustment process more precise.

【Bestrewing breadth】: According to the size of the wide and the current user Settings ranks spacing, to determine how much can output the most listed (i.e. X number) how many lines (i.e., Y number). Click on the button **【Brestrewing breadth】**, pop-up interface as shown in figure:



According to determine the button, the software can automatically calculate the entire width of the ranks of the arrangement number.

【 dislocation 】 : for some graphics, in arrangement, the dislocation arrangement, can make the arrangement more compact.



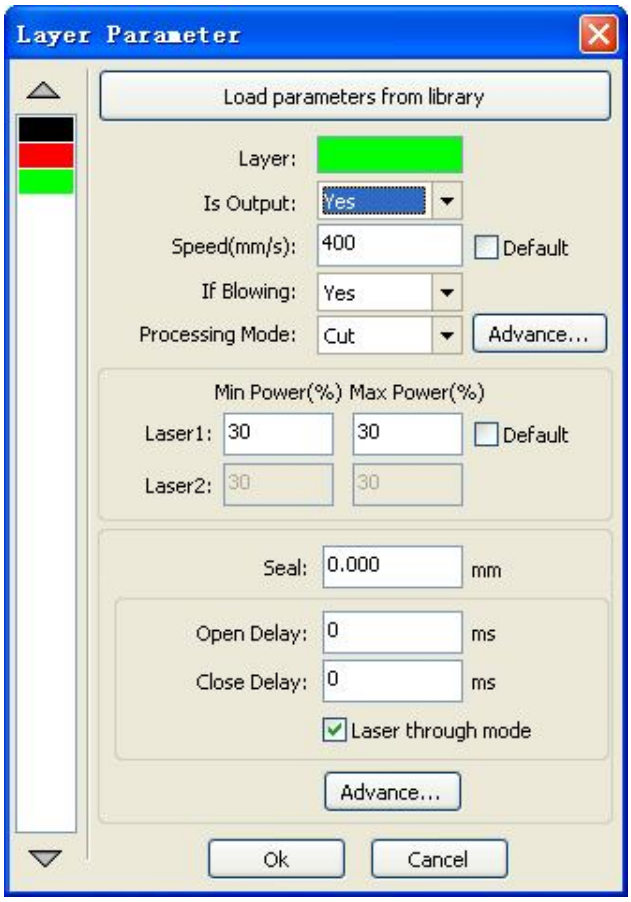
【The application to copy 】 in good array, chosen to copy graphics, some application to copy, already can duplicate array graphics.

In the layer list to edit the double click inside layer, namely will pop up layer parameter dialog box.

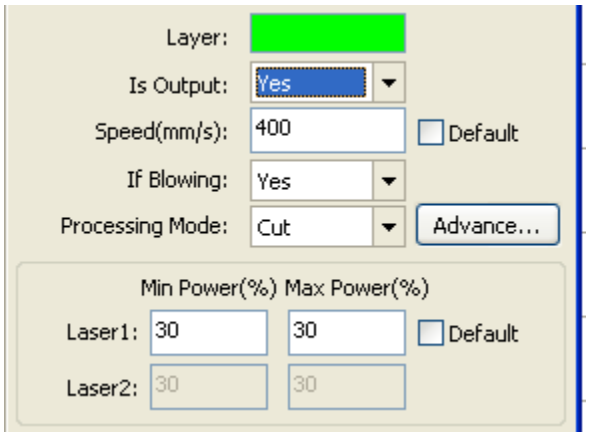
The left article color, representatives of the current graphics layer, choose different color, can be in already switch between different layer, one-time modified multiple layers of parameters.

The layer parameters is divided into two parts: public layer parameters and turn a layer parameters.Public layer parameters is to point to no matter how the layer processing type, all effective layer parameters;

Proprietary layer parameters is to point to the layer of processing type change of the corresponding parameters will also be changing.



6.10.2 Laser Scan Parameters Setting



Laser:Software to distinguish between different layers of the graphics processing technology parameters. For scanning processing methods, more are in the same layer bitmaps, and whole as a picture output, if hope each bitmap single output, it can be a graph respectively placed in different layer can.

Is Output:Have two options: yes and no. Choice is, the corresponding layer will output processing; Choose no, won't output processing.

Speed:The corresponding processing method of processing speed.

For cutting processing is concerned, the slower, processing the better, the more smooth track; The faster the processing results, the worse the trajectory smooth;

To scan for processing, the slower, under the same energy scanning depth, deep and scanning trace the thick, scanning the resolution also reduced.

The faster the same energy the shallow depth of the scanning, details distortion increase.

To fix for processing, the main change is empty the speed of the move.

If, check the "default", the actual speed by panel set up to speed.

If Blowing:f the machine external fan, and fan has enabled, then if choose "is", then this layer data processing, will open the fan, otherwise, will not open the fan. If you do not make can fan, no matter choose "yes" or "no", are meaningless.

Processing methods: says the method of processing corresponding layer;

If the currently selected is vector layer (i.e. color layer), it includes three choices: laser scanning, laser cutting, laser rbis;

If the currently selected is a tutu layer (namely BMP layer), the only include a choice: laser scanning.

Laser 1, laser 2: corresponding to the mainboard laser signals 1 and 2 of the way way laser output. If it is only head machine, the second road laser meaningless.

The minimum power, the maximum power: the power of the values of the range of 0 to 100, said that in the process of the strength of the laser processing; Big value, the laser is strong, is small, the laser weak. Minimum power loss to the most power is less than or equal to.

For different processing type has a different meaning.

For cutting processing, the actual power is cutting speed and phase follow, speed, low energy is also low, high speed is high also, so that we can guarantee the whole process of cutting energy evenly.So the minimum power the speed of the corresponding minimum energy, the minimum speed general is 0, but if set the speed is the minimum speed for takeoff take-off speed; The maximum power correspond to the layer speed.

Set minimum power, and the most high power flow:

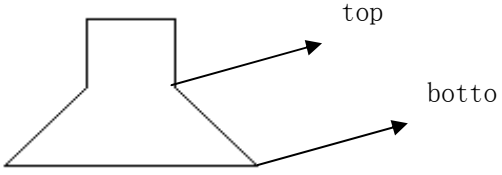
1> The minimum power and the maximum power set to the same value, synchronous adjustment. Until all the cutting curve are already appear.

2> The maximum power unchanged, and gradually reduce the minimum power until the energy of the heavy cutting curve at the lowest level, and all of the cohesion parts can be processed to come out.

3>If not yet to best effect, can be the most appropriate fine-tuning high power, and repeat step 2.

If is cut through, the minimum power loss and the maximum power no significant difference, can be set to give the same.

To scan processing, ordinary scanning, the minimum power and the maximum power must be consistent. Slope sculpture, minimum power loss is the power of the corresponding factors, the most power is the power of the bottom of the corresponding.

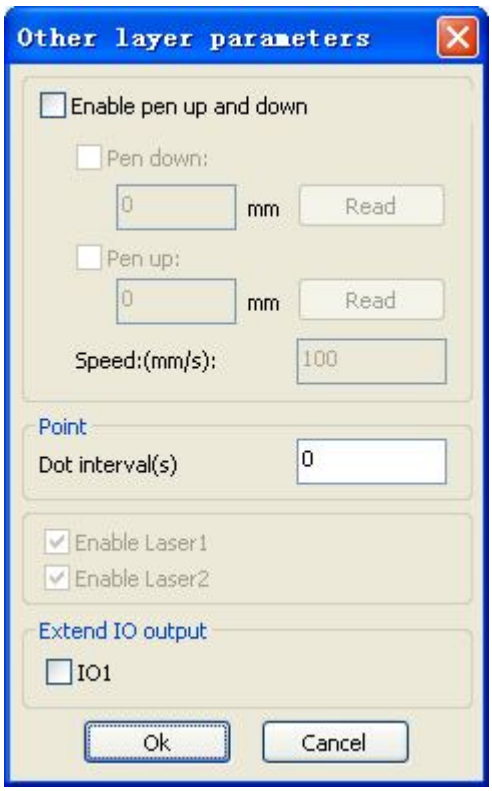


Minimum power loss is the top for the small slant wide, detail place distinguish clearly. Minimum power loss is too large slope not obvious.

To fix processing, the minimum power and the maximum power can be set to agree.

If checked "default", the actual power panel set by the power to determine.

Click the button "advanced", but also can be set to other layer parameters.



【Pen up and down】If machines have installed the lift platform, and need to be in a different platform height on the processing, can make can write up function.

Here the corresponding is platform write position in which high on the processing, carried the corresponding is empty pen position before go, platform should be moved to which level in the optical translation will not again to interfere with the process workpiece. If confirmed the optical not and the translation of the process workpiece to interfere, don't need to set up the pen position.

Use way is:

1> Can write pen to carry.

2>Make can write position, manual control panel key mobile platform, to stay processing graphics graphics processing plane, adjust the focal length. Then click button "read", and then write all set up position.

3>That can carry a position, manual control panel key mobile platform, move to the optical will not interfere with the work of the height, and through the panel key move the optical, confirmed that won't interfere, some button "read", and then set up a position.

【point】

Here the rbis, and is suitable for drawing tool create a point figure yuan, or from DXF file into the spot diagram yuan. And the current layer processing methods has nothing to do, namely whether the current layer is cutting or a scan, graphics in the spot diagram yuan has always been to the rbi way output.

The rbi movement speed for layer speed, beating the energy for the maximum energy layer laser.

【The laser Enable】

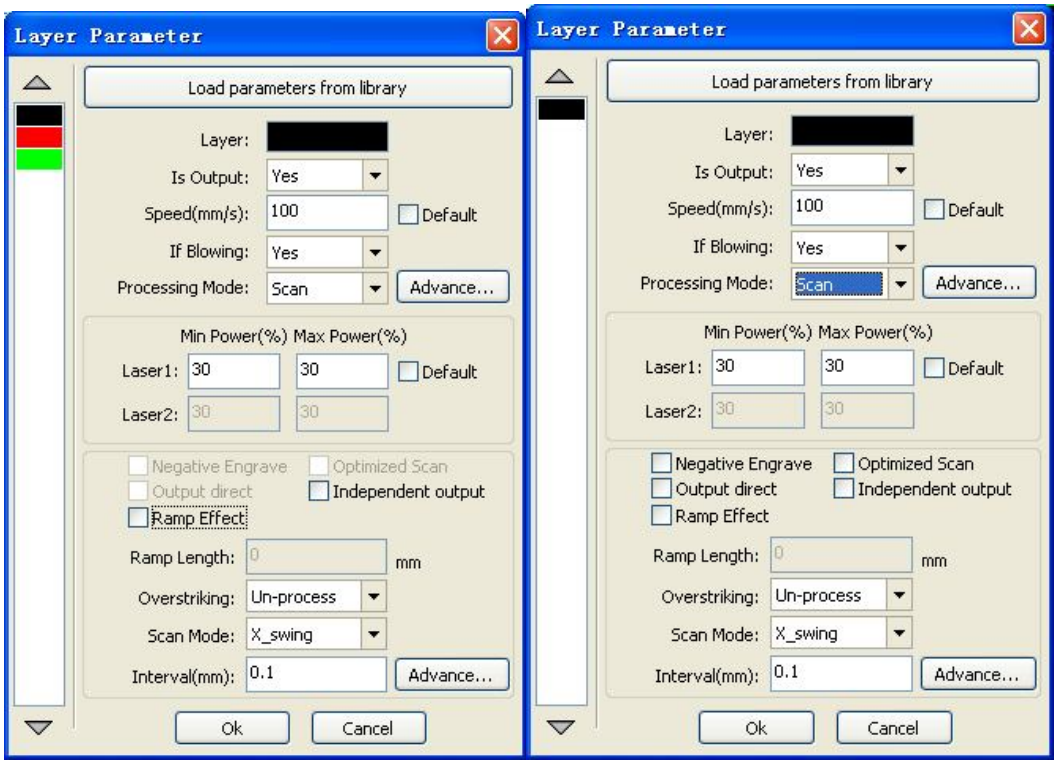
When the machine is equipped with two road laser, usually, are two road and output.

But the user may through the set that laser, that its not output all the way.

【The joint IO output 】

All the way and the layer associated IO output, obligate function.

6.10.3 Laser Scanning Parameters Settings



On the left of the dialog box for vector scanning parameters Settings, on the right side of the dialog box for bitmap scanning parameters Settings.

The vector data do not support the scanning the color carving, optimization scanning, direct output.

The color carving: normally scanning, bitmap in the black spots a laser, the laser in white.

Choose the color carving, the bitmap in the white of the laser, black spots in a laser.

Optimal scanning: choose optimization will automatically adjust the users scan the scanning interval to set up the best value, the scan best effect.

Otherwise, according to user Settings of the scanning interval scan pattern. Generally choose "optimal scanning"

Direct output: grayscale bitmap, according to the actual graphics gray.in output, already color deep place laser energy big, color shallow place laser

Energy is small.

Figure yuan respectively output: for vector graphics for, figure yuan respectively according to vector diagram output is the position of the yuan relationship, which in turn will get together the vector map carving output of yuan respectively.

If not checked figure yuan respectively output, it will be the whole vector graphics as a whole to sculpture.

For a bitmap for, if not checked figure yuan respectively output, the system will

automatically will work with a layer of the bitmap in as a whole output.

If checked the figure yuan respectively output, the system will be in a single output bitmap.

Slope effect: the scan the edges of the figure appear slope, submit stereo effect.

Be bold font: including don't handle, scanning the font, scanning the bottom. Generally choose not processing.

Scanning is part of the font scanning is the font, also is the Yin carving.

Note that the slope effect choice, please will be bold font choose not to deal with, or slope affected the effects.

Font Yin carved: not to add text outside the box, scanning are text itself, as below:

Font Yang carved: text and the outer frame, scanning is the bottom of the graphics, as below:

Scanning mode: including level one, level two-way, vertical one-way, vertical two-way.

Level one way: the optical scan pattern back and forth in a horizontal direction, but only to a direction when laser scanning comes out,Such as: when the optical scan from right to left a laser, and from left to right the laser scan.

Level two-way: the optical horizontal direction in the back and forth laser scanning graphics.

The vertical one way: the optical scan pattern in vertical direction back and forth, but only to a direction will be laser scanning,Such as: when the optical scan from up to down a laser, and from the bottom to scan a laser.

The vertical two-way: in vertical direction the optical back and forth laser scanning graphics.

Note: general use level two-way scanning mode.

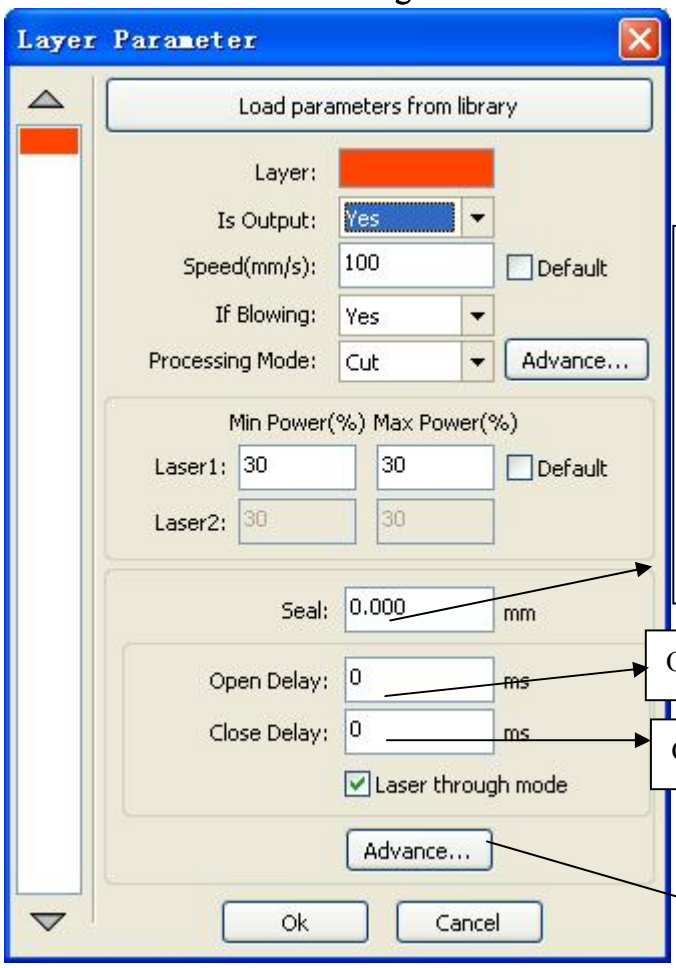
Scanning interval: namely the optical scan every much long distance under a line. The smaller the interval, scanning the deeper to graphics; Conversely, the more shallow.

Suggestions: (1) for vector layer (i.e. color layer), scanning interval in 0.1 mm general set below.

(2) for a tutu layer (namely BMP layer), scanning interval in 0.1 mm general set above,

Then through the change and the most high power to make the minimum power after scanning the graphics depth to achieve the ideal effect.

6.10.4 Laser Cut Parameters Setting



Seal cutting has not closed the graphics appear the case is closed, you can compensate with the seal to close, but if the seal is misplaced, you can not compensate, you can use 4.9.5 optimization backlash compensation to compensate, or to use the user parameter in the Backlash compensation .

Open delay

Close delay

If checked, the light switch delay is playing in time said.
Otherwise, the light switch delay said is laser movement delay.

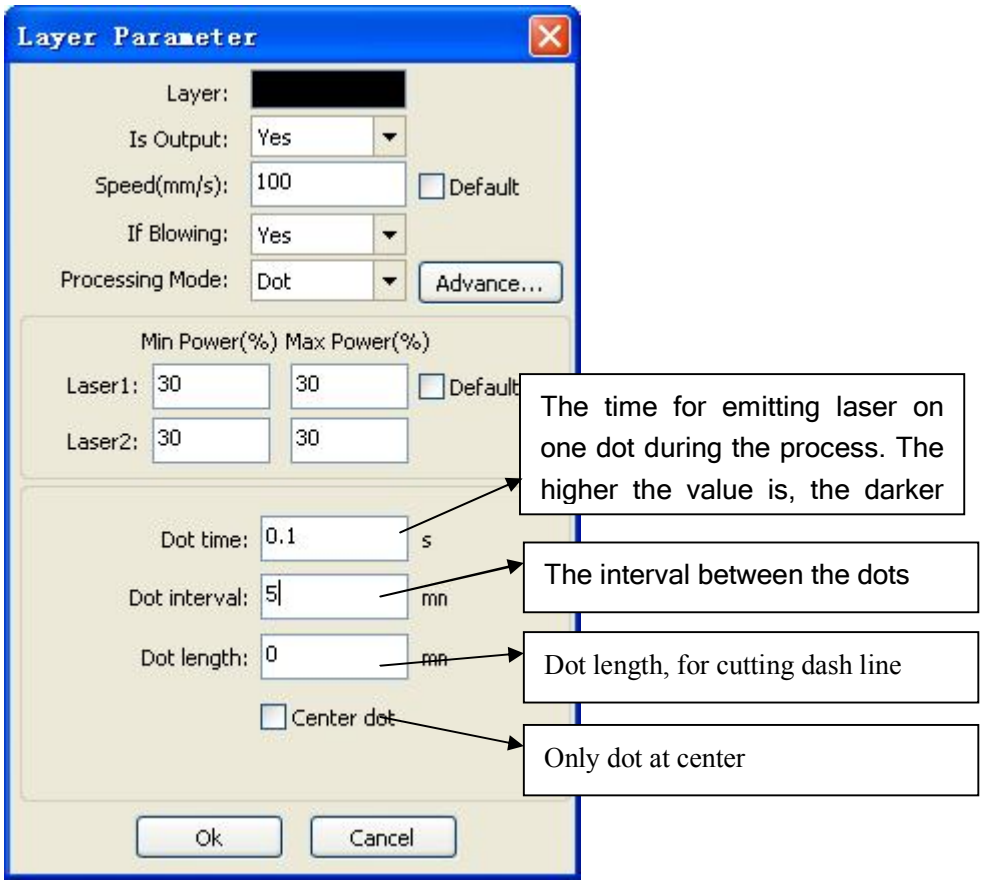
Using the slit width compensation can compensate for the offset between the graphics and the actual output graphics that caused by laser cutting.

It only has effective for the closed graph.

Direction: Compensation direction is set according to actual needs, such as cutting a circle, if you want to retain the cutting down of the circle, you should set out the direction of compensation; If you want to keep the hole should be set to compensate for the inward direction.

Sew width: it is the width of the laser.

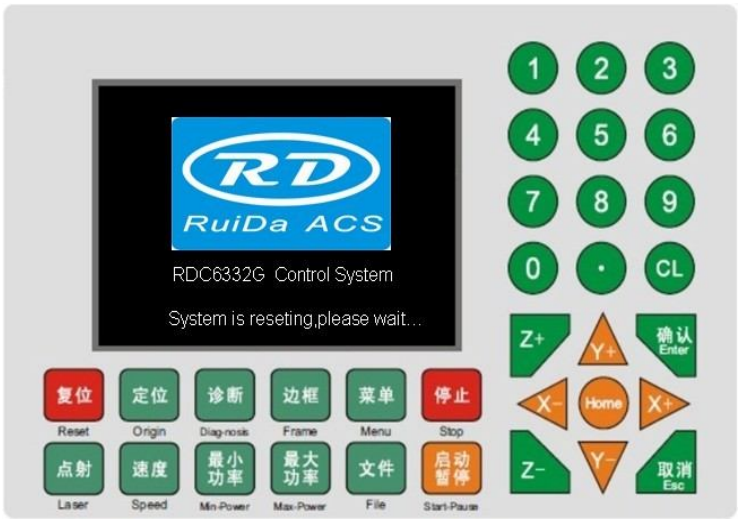
6.10.5 Laser Dot Parameters Setting



Chapter 7 Operating Instruction of Panel

7.1 Introduction to the keys

7.1.1 Introduction to the whole panel



7.1.2 Introduction to the keys

- "Reset" Key

:Reset the whole system;
- "Origin" Key

:Set the relative origin;
- "Laser" Key

:Let the Laser to splash;
- "Frame" Key

:To track by the current file's frame;
- "File" Key

:The management of the memory and U disc files;
- "Speed" Key

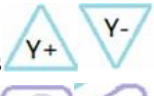
:Set the speed of the current running layer, or set the direction keys' move speed;
- "Max Power" Key

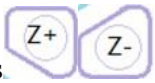
:Set the max laser power of the current running layer, or set the power of "Laser" Key;
- "Min Power" Key

:Set the min laser power of the current running layer,
- "Stop" Key

:To stop the work;
- "Start/Pause" Key

:To start or pause the work;
- "X+/-" Keys

:To move the X axes or the left/right cursor;
- "Y+/-" Keys 

:To move the Y axes or the up/down cursor;
- "Z+/-" Keys 

:To move the Z axes or change the parameter pages;
- "HOME" Key

:Let the selected axes go back to absolute origin;

- “Menu” Key

:Set the system parameter;
- “Diagnose” Key

:Diagnose the system, such as the limiter status, water protect etc.;
- “Esc” Key

:To stop work, or to exit to some munu.;
- “Enter” Key

: Validate the change;
- “Numeral” Keys

~

:To set the parameters;
- “Dot” Key

:To set the parameters;
- “CL” Key

:To cancel the last settings;

7.2 Introduction to the interface functions

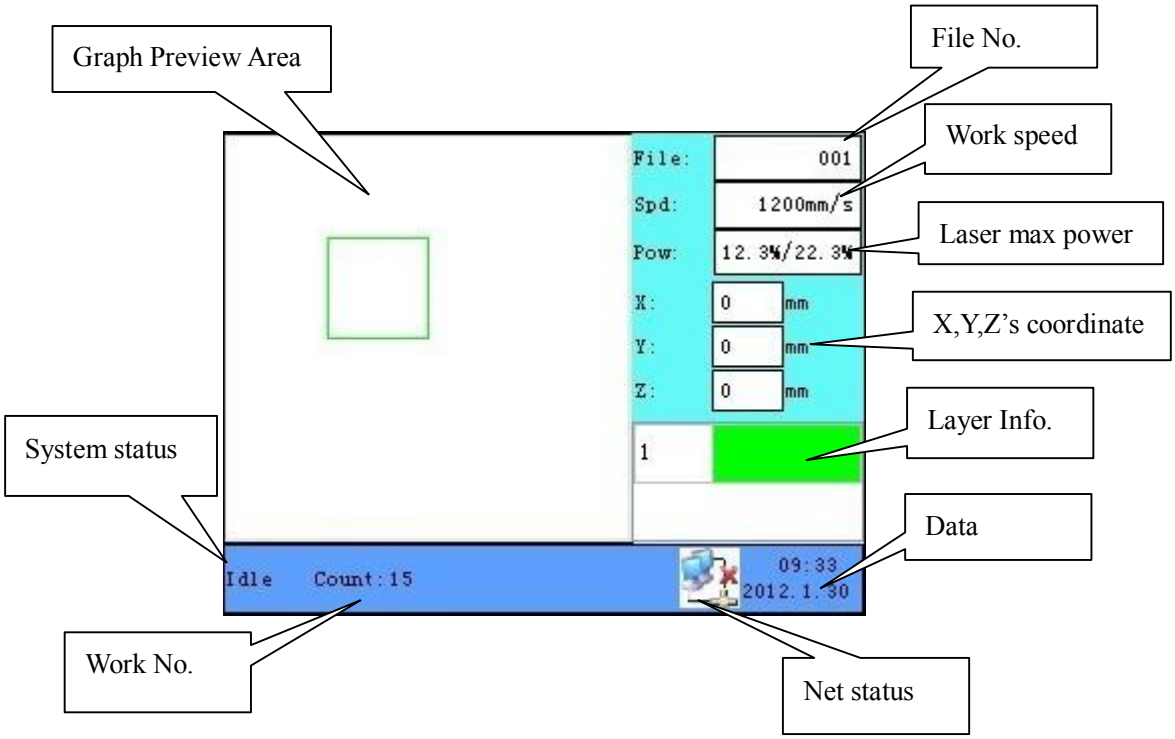
7.2.1 The screen of power on

When the system is powered on, the screen will show as below:

This power on screen can be changed by user. If the user-defined graph is downloaded by the PC software, when restart the system, it will show the new graph.

7.2.2 The main interface

When the system finished searching the machine origin, the screen will show as below:



Graph Preview Area: To display the whole file's track, and display the running track.

System status: To display the current status of the machine, such as Idle, Run, Pause, Finsh, etc..

Work No.:To accumulate the work number of the current file.

Net status:To display the connecting status of the ethernet.

Data:To display the system time.

Layer Info.:To display the layers' information of the current file, such as max or min power, speed etc.. When system is idle, dblclick the layer, then users can change the layer's parameters and the changing would be saved.

XYZ's coordinate:To display the coordinate of XYZ axes, and the size accurate to 0.1mm.

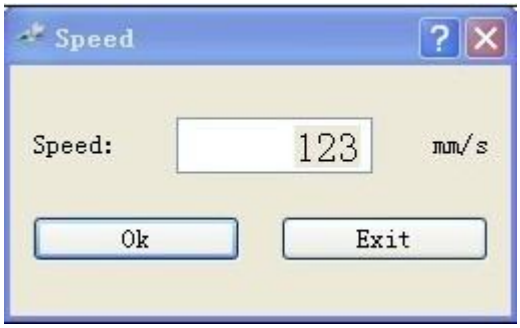
Laser max power:When system is idle, to display the "Laser" key's power, when system is running, to display the max laser power of the running layer.

Work speed: When system is idle, to display the "Up/Down" or "Left/Right" key's speed, when system is running, to display the running speed of the current layer.

File No.:To display the current selected file's number.

7.2.3 Speed settings

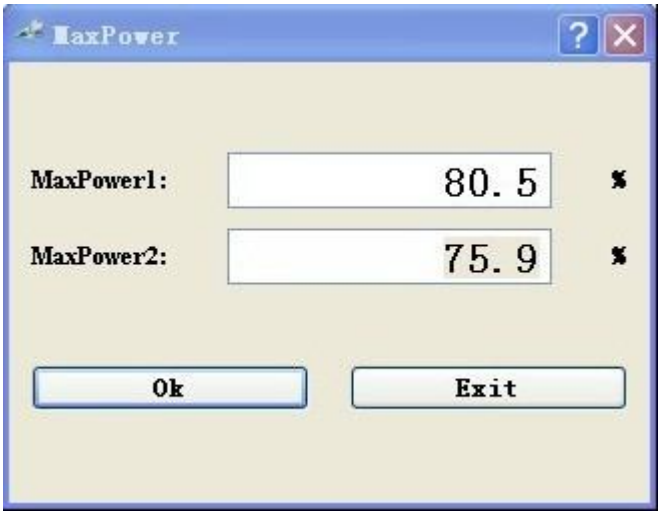
Push the "Speed" key when the screen is on the main interface, it will show as below:

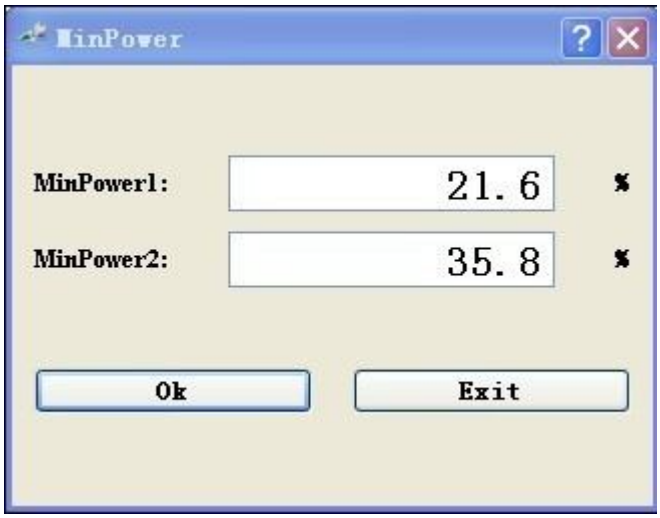


Push the "X+/-" Keys to move the cursor in the numeral area, then push the "CL" key to delete the old value, push the "Numeral" Keys to set the new value, then push the "Enter" key to save the change, push the "Esc" key to invalidate the change.

7.2.4 Max/Min power settings

Push the "Max Power" or the "Min Power" keys when the screen is on the main interface, it will show as below:





The way of changing the parameters is all the same as changing speed.

7.2.5 Reset the axes

Push the “Home” key when the screen is on the main interface, it will show as below:

Push the “X+/-“ Keys to move the cursor to one of the entry, then push “Enter” key to restart the selected axes, the screen will show some information when reseting.

7.2.6 Set the layer parameters

After selecting a file to preview on the main interface, user can push “Enter” key to let the cursor move to the first layer, then “Z+/-” Keys can be pushed to select the intent layer, on that time, user can push “Enter” key to check the selected layer’s parameters, show as below:

User can push “Z+/-” Keys to move the cursor on the intent parameter, then he could change the parameter if needed. “OK” to validate the change, and “Exit” to invalidate the change.

Here please notice that “Z+/-” Keys are used to move the cursor but not to move Z axes when the cursor is on the layer on the main interface, that’s to say, if user want to move the Z axes, he would firstly push the “CL” key to let the cursor disappear.

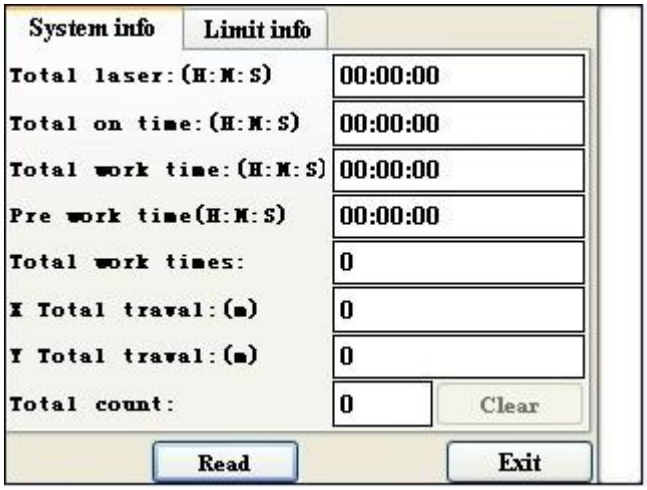
7.3 Introduction to menus

Push the “Menu” key when the screen is on the main interface, it will show as below:

Push “Y+/-“ keys to select the intent entry, then push “Enter” Key to check the sub menu.

7.3.1 Sys info

When the cursor is on “Sys info” entry, if “Enter” Key is pushed, the screen will show as below:



The default cursor is on “Read” button, push “Enter” key to read all the system info. and the limit info.. “Z+/-“ keys could be used to move the cursor, and when the cursor is on “System info” label, “Y+/-“ keys could be used to change the label between “System info” and “Limit info”

7.3.2 Sys config

When the cursor is on “Sys config” entry, if “Enter” Key is pushed, the screen will show as below:

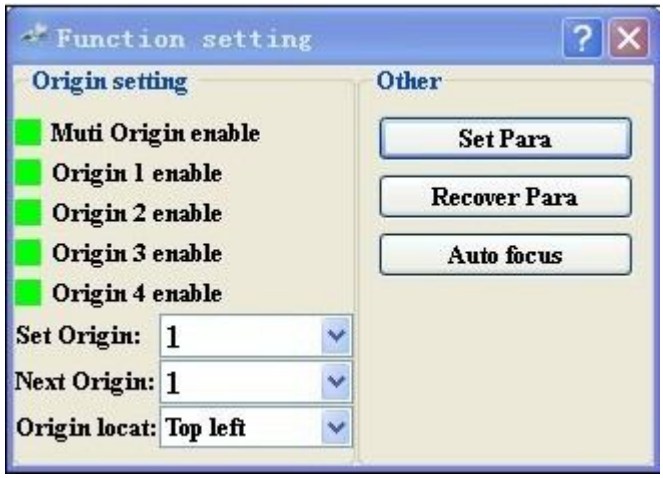
The default cursor is on “Read” button, push “Enter” key to read the config information. “Z+/-“ keys could be used to move the cursor to select the intent label. If some value is changed, move the cursor to “Write” button and push “Enter” key, then the changed value could be saved.

“Lcd type” can’t be changed.

There are two options in “Com” label, “Ethernet” and “USB”. If users want to change this value, a password would be needed, show as below:

7.3.3 Function sub menu

When the cursor is on “Func” entry, if “Enter” Key is pushed, the screen will show as below:



If the cursor is on "Origin X enable", push "Enter" key to enable or disable the selected origin, if it's enabled, the color frame would be red, otherwise it's green.

- Multiple Origin Enable: "Yes" or "No" can be selected. If you select "No", the system will use the single-origin logic. You can press the "Origin" key and set the origin, and only this origin can become valid. If you select "Yes", the system will use the multiple-origin logic and the "Origin" key on the keyboard become invalid. In such a case, the parameter of each origin must be set in the menu as follows.
- Origin X Enable: After the multiple-origin logic is enabled, the four origins can independently be prohibited and enabled.
- Set Origin 1/2/3/4: after the multiple- origin logic is enabled, you can stop the cursor at "Set as Origin 1/2/3/4". Press the "Enter" key on the keyboard and the system will take the coordinate figures of current X/Y axles as the corresponding ones to the origin 1/2/3/4.
- Next Origin: there are such five digits as 0~4 for option, which are the origins to be used for the next figure. Origin 0 means the origin set by the "Origin" key on the panel in the single- origin logic. 1~4 means the serial number of the origins in the multiple- origin logic. Next origin can be modified to any one of origin 1~4, so as to control the start location of next work (the premise is that the origin is enabled), but it can't be modified to origin 0.

Prompt	Once the multiple- origin logic is selected and if the serial number of the next origin is 1 and four origins are enabled, when the memory file function is started or the processing file is uploaded into the PC and this file selects "Take the Original Origin as current Origin", the work started for each time will use different origins. The rotation order of origin is 1->2->3->4->1->2…….

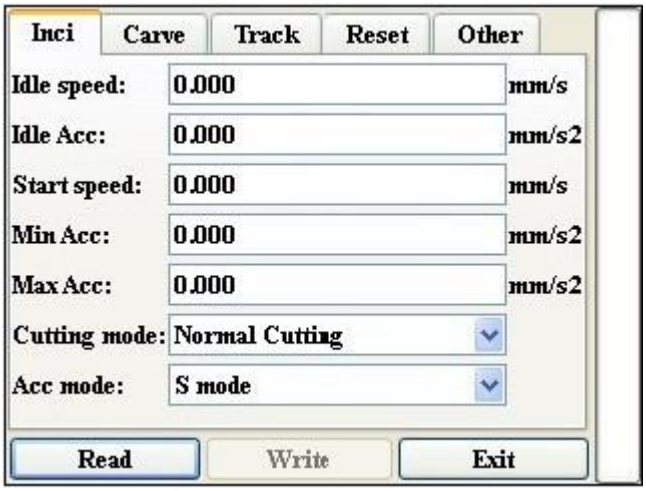
- Origin location: There are four entries to be selected: Top Left, Top Right, Bottom Left and Bottom Right. When one is selected, the previewed graph on the screen would be enantiomorphous based on X or Y direction.

Caution	This item is only used to preview the file on the screen, and it is invalid to the machine's movement.

- Set Para: After the "Set Para" is selected and the Enter key pressed, the interface will show the specific password to be entered when set as default parameter. After the manufacturer regulates all parameters of the machine well (including all manufacturer parameters and user parameters), this function can be used to store the well-regulated parameters to help users to recover the original parameters (including all manufacturer parameters and user parameters) through selecting "Recover Para" when they regulate parameters improperly.
- Recover Para: After the "Recover Para" is selected and the Enter key pressed, the "Successful Recovery" dialog box will pop up to prompt that all manufacturer parameters and user parameters are recovered successfully. You can return to the previous menu by press the Enter key.
- Auto Focus: When the cursor stops at "Auto Focus", press the Enter key to search for the focus(When there is z axes, and the z axes reset function is enabled, the auto focusing is valid); press the Esc key to return the prior menu.

7.3.4 User para

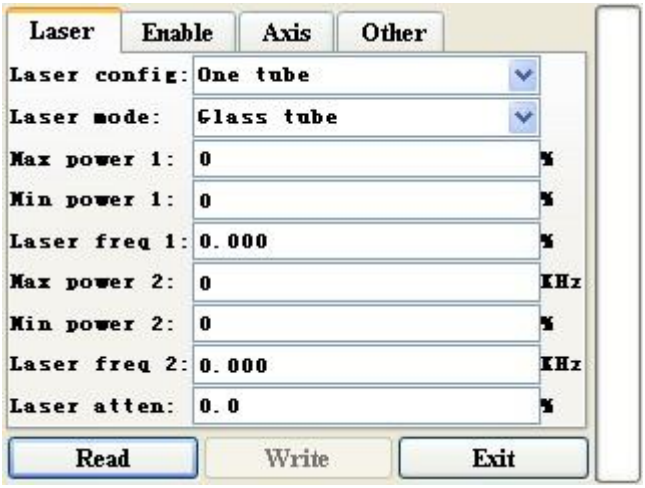
When the cursor is on "User para" entry, if "Enter" Key is pushed, the screen will show as below:



The default cursor is on "Read" button, push "Enter" key to read all the user parameters. If some parameters are changed, then press "Write" button to save the new parameters. "Write" button can be pressed only after "Read" button is pressed.

7.3.5 Machine para

When the cursor is on "Machine para" entry, if "Enter" Key is pushed, the screen will show as below:



The default cursor is on “Read” button, push “Enter” key to read all the machine parameters. If some parameters are changed, then press “Write” button to save the new parameters. “Write” button can be pressed only after “Read” button is pressed.

7.4 Introduction to file function

7.4.1 Memory file

On the main interface, if “File” key is pressed, it will show as below:

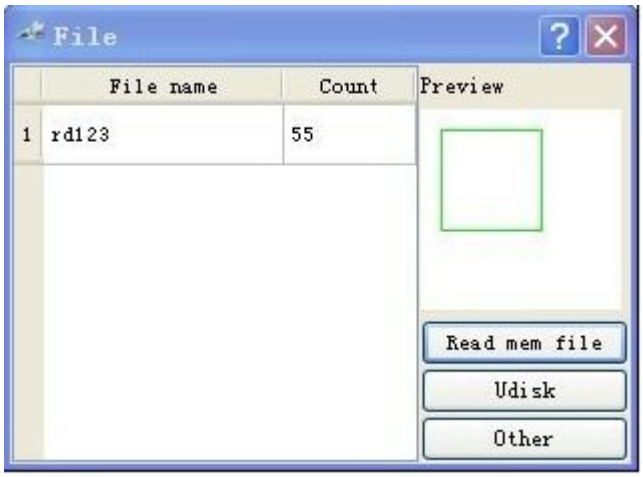


Figure: 7.4-1

When showing this menu, the system would read the memory file firstly, the file name and the running times would be listed in the left area, and the selected file is previewed in the top right area. “Y+/-“ keys could be used to move the cursor on the file name list. “Z+/-“ keys could be used to move the cursor on the button entry. When the cursor is on a target file name, presses the “Enter” key, the selceted file will be previewed on the main interface.

If “Home” Key is pressed when the cursor is on a selected file name, the screen will show as below:

Figure: 7.4-2

Run: To run the selected file.

Track: To track the selected file, and the track mode is optional.

Work time: To forecast the running time of the selected file, and the time is accurate to 1ms.

Clear count: To clear the running times of the selected file.

Delete: To delete the selected file in the memory.

Copy to Udisk: To copy the selected file to Udisk.

If the “Other” entry in figure7.4-1 is pressed, the system will show as below:

Figure: 7.4-3

Cur work time: To forecast the running time of the current file(the current file No. is showed on the main interface), and the time is accurate to 1ms.

Clear all mem file count: To clear the running times of every file in the memory.

Del all mem file: To delete all memory files.

Format memory: To format memory, and all the files in memory will be deleted.

7.4.2 Udisk file

If the “Udisk” entry in figure7.4-1 is pressed, the system will show as figure 7.4-4, and the operation method is all the same as figure 7.4-1

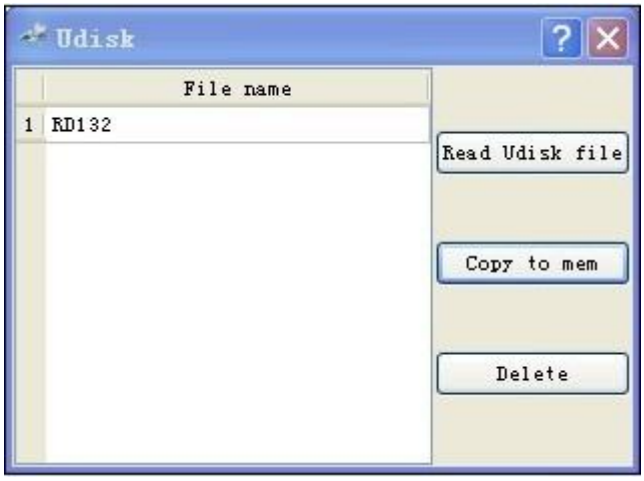


Figure: 7.4-4

Prompt	This system supports such file formats of USB as FAT32 and FAT16, but it can identify them when the files are put under the root directory of USB. The file name of more than 8 characters will automatically be cut out by the system. The file name that has only English letters and digits will not show when they are copied to the mainboard. The files copied from the mainboard to USB will be placed under the root directory of USB.

7.5 Introduction to diagnoses function

If the "Diagnose" Key in the main interface is pressed, the system will show as below:

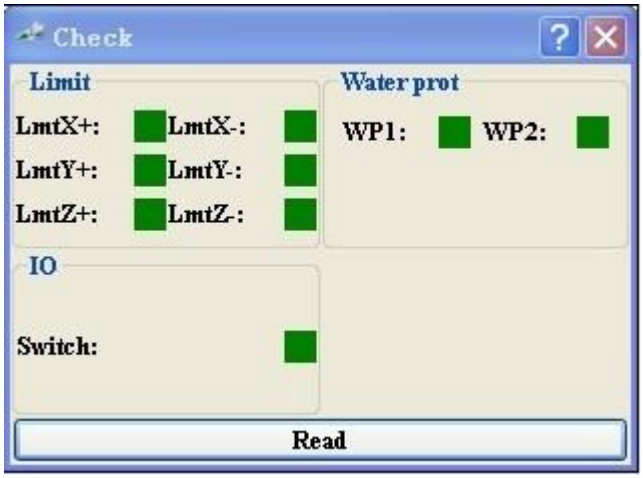


Figure: 7.5-1

This interface shows some system input information, such as limiter status, the status of the water protecting, and the status of the foot switch etc.. When the input is validated, the color frame will be red, otherwise it's green.

7.6 Introduction to some alarm info

When users are operating the system, or when the machine is running, some alarm information such as water protecting error maybe shows as below:

Chapter 8 Manufacturer/User Parameter Explanation

8.1 Manufacturer Parameters

(1) axes' parameters

- **Direction Polarity**: Modification of direction polarity can move the motor to the opposite direction. The modification purpose can move this axle to the origin on resetting. If this axle moves far from the origin on resetting, it means the direction polarity of this axle is wrong in setting and should be modified.
- **Spacing Polarity**: it is used to set the high and low level mode of spacing signal. When the motion axle arrives at the spacing position and input a low-level signal to the mainboard, the spacing polarity at this time should be set to be minus.
- **Key Polarity**: it is used to control the movement direction of the axle that is moved through manual operation of the keys. After the direction polarity is correctly set, if you press the directional keys on the operating panel, this axle will move to the opposite direction. In such a case the polarity of keys should be modified.
- **Control Mode**: Double pulse or direction+single pulse are optional, in general, direction+single pulse is selected.
- **Hard-spacing Protection**: it is used for whether the hard-spacing protection of this axle is enabled.
- **Reset Enable**: if the machine is provided with this axle, its "Reset Enable" should be opened; if no, its "Reset Enable" should be prohibited.
- **Motor Stepping**: it means the impulse equivalent, the absolute distance gone by the corresponding motion axle when a pulse is delivered to the motor. Prior to the correct setting of this value, a large rectangle can be cut with the machine (the larger the figure is, the smaller the difference is). The motor stepping can automatically be calculated according to the figure length and measuring length.
- **Takeoff Speed**: it means the speed of the motion axle in direct start from the idle condition. If this value is excessively large, it will make the motor lose steps, jar and even squeak; if small, it will reduce the running speed of the whole figure. If the inertia of the motion axle is larger (the axle is heavier), you can set a smaller takeoff speed; if

smaller (the axle is lighter), you can increase the takeoff speed. For example, the typical value is 5~30mm/s.

- **Maximum Speed**: it means the maximum limit of motion speed that this axle can bear. This parameter has something to do with the driving force of motor, the inertia of motion axle and its drive ratio. For example, the typical value is 200~500mm/s.
- **Acceleration**: it means the maximum acceleration of the motion axle in accelerated or decelerated motion. If the acceleration is set too large, it will make the motor lose steps, jar and even squeak; if too small, it will cause the reduction of acceleration so as to reduce the running speed of the whole figure. For the axles with larger inertia, such as Y axle corresponding to the beam, its typical setting range is 800~3000mm/s2; for the axles with smaller inertia, such as X axle corresponding to the car, its typical setting range is 8000~20000mm/s2.
- **scope**: it means the farthest distance that the motion axle can move, which is determined in accordance with the actual condition of the machine.
- **Key Move Takeoff Speed**: it means the starting speed to move this axle by way of the keys on the keyboard, which can't be higher than the takeoff speed.
- **Key Move Acceleration**: it means the acceleration to move this axle by way of the keys on the keyboard, which can't be higher than the maximum acceleration of this axle.
- **Scram Acceleration**: if this axle enables the hard-spacing protection, when this axle moves to the spacing position, it will scram operation at the scram acceleration. This value can be 2~3 times of the maximum acceleration for this axle.
- **Distance from Origin to Hard Spacing**: if this axle enables hard-spacing protection, generally this value should be set to be 2~5mm; if it is set to be 0, when this motion axle moves to the smallest coordinate, i.e. 0, this spacing may be validate, which may wrongly triggers the hard-spacing protection and scram the machine. If the hard-spacing protection is not enabled, this value can be set to be 0~5mm.

(2) Laser parameters

- **Laser Configuration**: single laser and double lasers are available for option and set in accordance with the laser-tube quantity provided by the manufacturer.
- **Laser Type**: glass tube, RF laser (not need pre-ignition pulse) and RF laser (needing pre-ignition pulse) available for option.
- **Maximum Power 1**
- **Minimum Power 1**
- **Laser PWM Frequence 1**
- **Maximum Power 2**
- **Minimum Power 2**
- **Laser PWM Frequence 2**
- **Laser Attenuation Quotiety**

Laser PWM Frequence is used to set the pulse frequency of control signal used by this laser, in general, glass tube is about 20KHZ, RF laser is about 5KHZ ; the maximum/minimum power (%) is used to set the limit power of this laser, that is to say, during the operation, the maximum power set by the user can't be higher than that set here and the minimum power set by the user can't be less than that set here, either. When a laser's power is attenuated, then the laser attenuation quotiety may be set.

Prompt	If it is only provided with the single laser, it can show the one-path parameter.

(3) Other Manufacturer Parameters

- **Machine Type**: In most cases, the general engraving machine should be selected and other types used for specific purposes.
- **Feeding Mode**: it has single-way mode and two-way mode for option. If it is of single-way feeding, it is unnecessary to check the coordinates. Feeding can be conducted in the single-way mode; if it is of two-way feeding, the system will check the maximum and minimum coordinates. The odd sequence means feeding should be done to one direction and the even sequence means feeding done to the other direction. The initial direction for the first time can be changed through setting the directional polarity or modifying the plus and minus values of the feeding length. This parameter is valid only when the "Z axes function" is configured to "Drive for Feeding axes".
- **Power-Off-Restart Delay**: it can be set to be 0~3000ms. After the power-off of the electricity grid, the power supply of the system will not drop to 0 at once. There is a delay during this time. The delay value set here should basically consistent with the actual off-delay value. If the deviation of set value is larger, on the de-energizing for continuous engraving, either the figure processed for the second time is not closed with that before the cutoff, or it is coincided with that too much.
- **Transmission Mode**: generally the "Belt Stepping Type" should be made choice of. The control algorithm will be changed a little when other types are selected.
- **Z Axes Function**: "Drive for flat" or "Drive for Feeding axes" are optional.

Prompt	After the configuration parameters in the manufacturer parameters, such as directional polarity, control mode, laser type and laser PWM frequence, are modified, the system should be reset. Such a modification can function upon the resetting of the system.

(4) Enable Parameters

- **Laser 1 Enabled**
- **Laser 2 Enabled**
- **Water Protector 1 Enabled**
- **Water Protector 2 Enabled**
- **Door Opening Protection**
- **Whether to Enable the blower**

Prompt	The Enable Parameters are to enable or disable above functions. If the machine is provided with the parameter for the single laser in the manufacturer parameters, the display entry of enabling parameter will change accordingly.

8.2 User Parameters

(1) Cutting Parameters (Only affect cutting arts)

- **Idle Move Speed**: this parameter decides the highest speed of all non-lighting lines for the machine in the movement process.
- **Idle Move Acceleration**: it means the highest acceleration of all non-lighting lines. Idle stroke speed and idle stroke acceleration can be set higher to reduce the working time of the whole figure, but if they are set too high, it may cause the jarring of track, so comprehensive consideration should be given to the setting.
- **Turning Speed**: it means the speed of turning at the acute-angle corner, which is also the highest speed in the whole cutting process.
- **Turning Acceleration**: it means the acceleration of turning at the acute-angle corner when cutting. If the two speeds are set too high, jarring will happen to the turning; if set too low, it will influence the cutting speed.
- **Cutting Acceleration**: it means the highest acceleration value in the whole cutting process.
- **Cutting Mode**: it is divided into high-speed cutting and precision cutting. In high-speed cutting, priority is given to the cutting speed, but in precision cutting, the cutting effect.
- **Acceleration Mode**: it is divided into T acceleration and S acceleration. T accelerate will quicken the whole cutting process, but it will result in that its cutting effect is inferior to that of S acceleration.

(2) Scanning Parameters (Only affect scanning arts)

- **X-axle Starting Speed**
- **Y-axle Starting Speed**
- **X-axle Acceleration**
- **Y-axle Acceleration**

The above four parameters are used to set the starting speed and acceleration of two axles on the scanning. The higher the two speeds are, the quicker the scanning is.

- **Scanning Line-feed Speed**: this parameter is specially used to control the highest speed at which that the previous line vertically moves to the next line in the scanning mode. If the space between lines is larger during the scanning or if the distance of each block is larger during the scanning and deblocking of figure, it is necessary to position each line or block accurately. In such a case the speed of scanning line-feed can be set as a lower value.
- **Scanning Mode**: it is divided into general mode and special mode for option. If special mode is used, the laser power should be increased. The smaller the speckle percentage is, the more the laser power reduces. The laser power to set should be larger in order to reach the same scanning depth. The purpose to select the special mode is to make the laser light at high power and short time. On the depth scanning the effect that the bottom is flatter is obtained, but it should be noticeable that if the speckle adjustment is not appropriate, it can achieve this goal. If the high power remains short, the lighting mode will influence the life of the laser. The system will default the selection of general mode.
- **Speckle Size**: When the general mode is selected as the scanning mode, this parameter

will become ineffective; when the special mode is selected, this parameter will become effective. The controller will control this parameter among 50%~99%.

Prompt	The cutting and scanning parameters can't exceed the limited ones in the axle parameters. If so, the setting will become ineffective and the system will automatically cover the parameters with the axle parameters.

(3) Reset Parameters

- **Reset Speed**: it means the speed of X/Y-axle linkage reset to the origin.
- **X-axle Startup Reset**
- **Y-axle Startup Reset**
- **Z-axle Startup Reset**
- **U-axle Startup Reset**

You can select "Yes" or "No" in the field of the above four parameters, which is used to confirm whether each axle can be reset on the startup.

(4) Frame Setting

- **Bordering Mode**: "Blanked Bordering" means idling to start border preview; "Outputted Border Cutting" can manually cut off the well-processed figure; "4-corner Dotting" means to emit the light at four corner points of the frame to make a point and turn off light. The size and position of this figure can be checked intuitively through the four points. The bordering speed is the speed value set on the keyboard when the system is idle. For light output, its minimum/maximum power is the corresponding value set on the keyboard when the system is idle (The lasering power on the 4-corner dotting means the well-set maximum power).
- **Margin Distance**: It means whether to extend a certain length outside the actual frame of the figure on the preview/cutting of frame.

Prompt	If the frame crosses the border, the interface will prompt it. If the Enter key is pressed at this time, the system will cut the border at the maximum/minimum coordinates first, and then border the figure. This bordering can be given up.

(5) Other User Parameters

- **Array Mode**: Two-way array or one-way array can be selected. Two-way array means the to-and-fro cutting of array in sequence; one-way array means the cutting of array from one direction to another. On selecting one-way array, the elements of each array are the same in action mode and completely uniform in action fluency, which takes a little more time than two-way array. Two-way array is the default option.
- **Back Position**: The origin (the relative origin) and the machine's absolute origin can be selected. This parameter decides the parking position of laser head after each work.
- **Before-feeding Time Lag**: settable at 0~300s. The lagged time can facilitate user's feeding and picking on the feeding device.
- **After-feeding Time Lag**: settable at 0~9.9s. It can facilitate the feeding device's delaying in jarring after moving to the correct position and waiting for the 2nd work after the feeding axle stands still completely.
- **Focus Setting**: it means the distance from the focal point of laser head lens to Z-axle

origin. When there is no automatic focusing function, this parameter becomes invalid.

- **Backlash X**：The X axes' backlash, accurate to 1um.
- **Backlash Y**：The Y axes' backlash, accurate to 1um.